Railway Age Gazette

PUBLISHED EVERY FRIDAY AND DAILY EIGHT TIMES IN JUNE BY THE SIMMONS-BOARDMAN PUBLISHING COMPANY
WOOLWORTH BUILDING, NEW YORK.

CHICAGO: Transportation Bldg. CLEVELAND: Citizens' Bldg.
LONDON: Queen Anne's Chambers, Westminster.

E. A. SIMMONS, *President.*
L. B. SHERMAN, *Vice-President.* HENRY LEE, *Sec'y & Treas.*
The address of the company is the address of the officers.

EDITORS
SAMUEL O. DUNN, *Editor.*
ROY V. WRIGHT, *Managing Editor.*

W. E. HOOPER	H. F. LANE	W. S. LACHER
B. B. ADAMS	R. E. THAYER	C. W. FOSS
E. T. HOWSON	A. C. LOUDON	F. W. KRAEGER
H. H. SIMMONS	C. B. PECK	J. M. RUTHERFORD

Subscriptions, including 52 regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free:

United States and Mexico	$5.00
Canada	6.00
Foreign Countries (excepting daily editions)	8.00
Single Copies	15 cents each

Engineering and Maintenance of Way Edition and four Maintenance of Way Convention daily issues, North America, $1; foreign, $2.

Entered at the Post Office at New York, N. Y., as mail matter of the second class.

WE GUARANTEE that of this issue 8,650 copies were printed; that of these 8,650 copies, 7,384 were mailed to regular paid subscribers to the weekly edition, 184 were provided for counter and news companies' sales, 975 were mailed to advertisers, exchanges and correspondents, and 107 were provided for new subscribers, samples, copies lost in the mail and office use; that the total copies printed this year to date were 331,850, an average of 9,218 copies a week.

THE RAILWAY AGE GAZETTE and all other Simmons-Boardman publications are members of the Audit Bureau of Circulations.

VOLUME 59 SEPTEMBER 3, 1915 No. 10

Contents

EDITORIAL:
Editorial Notes 413
Electro-Mechanical Interlocking 414
Are Our Governments Perfect? 414
The Railways Must Make Their Own Fight 415
NEW BOOKS 415
LETTERS TO THE EDITOR:
The Unnoticed Unorganized Employee 416
Handling of Claims for Perishable Freight; by J. F. Boylan 416
Officers Must Be Trained in the School of Experience 417
Commending Good Service vs. Condemning Bad 418
Conditions That Need Correcting 418
MISCELLANEOUS:
*Electro-Mechanical Interlocking at Trenton; by W. M. Post 419
*Construction of the New York Connecting Railroad 421
Rules for Inspection of Locomotives 426
Great Achievements of German State Railways; by F. W. Wile 428
Welfare Work on the Pennsylvania 430
*Humidity-Controlled Dry Kiln on the Norfolk & Western; by W. H. Lewis 431
Report of Commission on Industrial Relations 433
The Qualifications of a Terminal Superintendent; by S. W. Roberts 434
GENERAL NEWS SECTION 437

*Illustrated.

Not long ago the Central of Georgia revised the form which it uses to send out monthly statements of earnings and expenses. In addition to the usual columns of figures showing the month's earnings and accumulated earnings for the fiscal year to date, with comparisons for the previous year, this form contains a statement showing the percentage of total operating expenses which were distributed on payrolls to approximately so many persons, "substantially all of whom reside on the company's lines," and also a statement of the amount spent for materials and supplies, "the cost of which includes large payments for labor expended on them before they were consumed." Fairfax Harrison, shortly after returning to the Southern Railway as its president, pointed out in an address to business men of the South how large a proportion of all of the money collected by the Southern Railway from the southern people is almost immediately distributed again in the same territory. Ordinarily the monthly earnings statements of railway companies are of primary interest to investors and to bankers; but the Central of Georgia's new form of statement suggests a way in which they can be made of interest to local newspaper editors and of value in promoting a better understanding between the railroads and their patrons. The fact that of the hard-earned dollars which a farmer pays on a freight bill or through the ticket agent's window little more goes out of the county than of the dollars he pays to his hands cannot be reiterated too often.

Railroads and the Local Public

A committee of the Association of American Railway Accounting Officers has been making inquiries as to the attitude of the railroads in regard to the desirability of changing the fiscal year, insofar as reports to the Interstate Commerce Commission and to state commissions are concerned, from June 30 to December 31. The committee made inquiry of 200 roads, with an aggregate of 271,857 miles of railroad. Of these, 130 roads, operating 212,542 miles, or 78 per cent of the total mileage of which inquiry was made, voted in favor of changing the period for making reports from June 30 to December 31; 32 roads, with a mileage equal to 5 per cent of the total, did not vote, and 38 roads, with a mileage equal to 17 per cent of the total, voted against the change. The *Railway Age Gazette* has for some time past advocated a change in the fiscal year both for reports to the Interstate Commerce Commission and state commissions, and for reports to stockholders. One of the most important reasons why this change should be made is that there will then no longer be the same temptation that there is now to delay maintenance work in May and June so as to keep the expense of it out of the fiscal year about to close. Presumably the roads operating 17 per cent of the mileage from which inquiry was made either desire to have this opportunity to make a showing by delaying maintenance work left open to them or do not think that the advantages to be gained are equal to the cost and trouble of making the change. This appears to be a shortsighted or a rather selfish point of view. Even if a particular company is so prosperous as to never feel the temptation to delay maintenance in May and June, it ought to be willing to put its accounting department to the comparatively small expense and temporary trouble to make the system uniform and to carry out a reform which is for the good of the great majority of companies.

Changing the Fiscal Year

The Pennsylvania Railroad, in its last publicity pamphlet, noticed on another page, tells one of the most striking facts that have come to light in connection with the railroad service for many a day, the operation of the Pittsburgh freight transfer station, with a force of 318 laborers, for 23 months, with practically no change in personnel; only one new man being taken on in all that time. George F. Wagner took charge of the station 30 months ago, and it is his personal efforts—or genius—to which this result is to be credited. Any railroad man acquainted with freight-house work will readily accept the statement in the pamphlet that it "would be most difficult to duplicate" this record of efficiency and of physical and moral character of the individual men. The story, as printed, is all too short, and the railroad world will be eager to learn about the "other diversions" that have made this work so attractive. And who shall say that the music is not one of the main elements in this remarkable "uplift?" As everybody knows, the unique social successes that have been recorded at the Isthmus of Panama during the last ten years have been due largely to the

A Remarkable Gang of Freight Handlers

wise management of recreation. Paternalism in the management of large enterprises has its occasional virtues, in spite of its dangerous nature. Railroad men will recall that one of the best records ever made in railroad building was that made by the paternal—the despotic—Russian government, beyond the Caspian sea, 25 years ago. Music, by well-trained bands, was a permanent feature of the off-duty life of the workmen there, and the moralé of the forces was notable. This paternalism at Pittsburgh evidently is of a kind that anybody can safely copy; anybody, that is, who, like Mr. Wagner, "believes in" welfare work. A "belief." in the mind of a strong leader, is essential in any important work.

ELECTRO-MECHANICAL INTERLOCKING

THIS term, as used by signal engineers, means an interlocking plant where the switches are moved manually—by means of the ordinary "mechanical" machine, with its long levers and its rod connections along the ground—while the signals are worked by electric motors, a motor at each signal, controlled from the cabin, as in a power apparatus. With electric motors the signalman has to put forth no more physical effort than he does to turn a doorknob; and a succession of operations can be performed almost as fast as the mind can decide on them. The description of the interlocking at Trenton, N. J., printed on another page, will attract the attention of many readers not particularly interested in signal engineers' technicalities, and it has seemed desirable, therefore, to explain this somewhat arbitrary use of terms. This combination of man-power and electric-energy is now so common in the signaling field—there being over 40 plants on the Pennsylvania alone—that the subject should be of general interest, and a brief comparison between this and the older arrangements will be found profitable. In passing, the reader should be cautioned concerning another arbitrary use of terms—a misnomer, in fact; the universal use of "lever" for the handle by which a signalman causes the movement of a switch or signal. In power interlocking the "lever" may be a sliding bar, to open or close an electric circuit, or a little crank to turn a spindle on its axis; but it is a "lever" all the same, so strong is the force of habit.

Electro-mechanical interlocking, when compared with mechanical interlocking which has no electrical features, presents a complexity of electrical devices and circuits, and involves increases in the cost of installation, of maintenance and of operation; and it is justified only by the increased safety and facility of operation that is obtained. That the improvement is believed to be justified is evident from the extensive use already noted. The 44 plants on the Pennsylvania have been put in use during the last six years; some of them new and some reconstructed plants. And there are numerous similar plants on other roads. The electro-mechanical plant, like the purely mechanical, is subject to the limitation of the distance at which switches can be operated, but the speed of operation is somewhat greater because of the smaller size of the machine and the smaller number of heavily loaded levers to be thrown for a given movement. In the nature of things, electro-mechanical cannot displace complete power interlocking to any great extent. The latter has its own field, where either some of the switches are too far from the machine for manual operation or the number of train movements is so great that ease and quickness of operation are essential.

Electro-mechanical interlocking is simply the result of the gradual addition of electrical devices to mechanical interlocking plants and the substitution of electrical for mechanical operation or control of certain parts of such plants. Probably the first step was electric locking, in the nature of approach locking or approach and route locking to prevent the movement of switches and derails when trains for which the signals had been cleared were approaching and passing through the plant. Next came power-operated distant signals, installed because it was practically impossible to move signal arms by either rods or wires at the long distances required to admit the fastest trains being stopped between the distant and home signals. As a third step, home signals were made semi-automatic when the plant was within the territory of an automatic block system. At first the "electric slot" in the mechanical connections on the signal post, was used for this purpose. But, particularly where the home signals were made three-position and controlled by automatic signals in advance, power mechanisms were also used. It was then that some of the levers in the machine in the cabin ceased to be "mechanical" levers and began to control electric circuits only—a function for which the smaller levers, used in power-interlocking machines, were better adapted. The electric locking of individual switch levers, or facing-point-lock levers—section locking—followed, and finally electric locking, or control, designed to prevent the clearing of the signal for any given route, unless the actual position of the rails of each switch in that route corresponded with that of the lever for that switch.

Now a mechanical plant to which some or all of these electrical features had been added, might, perhaps, properly be called an electro-mechanical plant. But the final development was the electro-mechanical machine, combining mechanical levers for operation of the switches (and for facing point locks, where these are used) with small levers, of the type used in power-interlocking machines, for the operation of the signals and, in many cases, for control of the mechanical levers. In practice a plant is not usually called an electro-mechanical interlocking unless it has an electro-mechanical machine and all, or nearly all, of the electrical features mentioned.

The electro-mechanical machine, for a given plant, has the advantage over a mechanical machine equipped with electrical devices on the mechanical levers, that it can be more readily and rapidly operated on account of its smaller size; and, in the opinion of some signal engineers, the electrical parts of the machine are better suited to their purposes and more reliable. At the same time a saving in first cost is sometimes possible because the machine occupies much less floor space, and a smaller cabin can therefore be built.

From this brief outline it will be seen that this elaboration of what was at first a simple process—the insuring that a signal lever should not be moved to "clear" until its corresponding switch lever was surely set right—has been a logical and, we may say, an inevitable process. At each point where the original interlocking mechanism of 1860-1875 fell short of affording everything that the operating officer could demand, the signal engineer was called upon to provide something new; and he has responded with notable promptness and efficiency. He has perfected his interlocking with marked resourcefulness and economy. And here, as in so many other questions of the railroad plant and its maintenance, economy is the final test. Not that "safety first" is neglected; not by any means. Indeed, in the signal engineer's office safety first goes without saying.

ARE OUR GOVERNMENTS PERFECT?

IN the *Railway Age Gazette* for August 13, there was published an editorial entitled "Our Inefficient Governments." We pointed out therein that government regulation of business usually is inefficient and fails of its purpose. The Eastland disaster, occurring in spite of government inspection of steamships, was cited as an illustration. Our esteemed contemporary, the Topeka Capital, says that the *Railway Age Gazette* "therefore concludes as a logical proposition that the government should quit attempting to regulate business." We beg to say to the esteemed Capital that its statement regarding our conclusion is not true. The conclusion which we drew was, we thought, as clearly stated as the English language would permit. It was not that government regulation should be abolished, but that there ought to be a movement to make our governments more efficient so that regulation would be more intelligent, and in consequence would secure the results which it aims at.

The concluding sentences of the editorial in this paper, to which the Capital refers, were as follows: "When shall we have an honest, energetic and widespread movement for making our governments competent to perform the functions they

already have? Raising them to this plane of efficiency is absolutely prerequisite to raising them to the still higher plane of efficiency where they will be fit to perform large and important additional functions. The advocates as well as the opponents of further increases of government functions ought to be able to unite in such a movement; for by far the strongest argument at present against further increases of government functions is the almost imbecile inefficiency which most of our governments display in most of the things that they now undertake."

This is not, as the Topeka Capital strangely asserts, "an argument for anarchy." It is not an argument for no government but for better government. Does not the Capital agree with us that we need better management of our governments, as well as of our railways? Or does the fact that the editor of the Capital is also the governor of Kansas make all governments entirely satisfactory to it?

THE RAILWAYS MUST MAKE THEIR OWN FIGHT

THE worst part of government regulation of railways in this country is the regulating done by the states. There is, and doubtless always will be, a good deal of complaint and criticism regarding federal legislation and the way the Interstate Commerce Commission performs its duties. But the regulating done by the federal government is in intelligence and fairness as far above that done by the states as the heavens are above the earth.

There have been some state commissions whose performance of their functions has been on a high plane. This formerly was notably true of the Railroad Commission of Massachusetts. It has been and is still true of the Railroad Commission of Wisconsin. The Wisconsin commission is strict to severity in controlling the concerns subject to its authority, but its expertness and justness command confidence and respect. The same used to be true of the Public Service Commission of the Second district of New York. But most state regulation, whether by legislatures or commissions, is as inexpert as it is unfair. Besides, as to most matters, there is no consistency between the policies of the various states, except that most of them squeeze the roads as hard as the constitution and the courts will let them. Finally, regulation by the federal government and by the various states involves much duplication and therefore much waste of energy and money on the part of both the railways and the governments.

State regulation ought to be either eliminated or brought into harmony with and subjection to federal regulation. In the Shreveport case the Interstate Commerce Commission found that there was unfair discrimination between the state rates from jobbing points in Texas to consuming points in east Texas and the interstate rates from Shreveport, La., to the same consuming points, and held that the railways must correct this by raising the state rates or reducing the interstate rates. The commission made clear that the discrimination resulted chiefly from the fact that the state rates were unreasonably low. Subsequently, when the eastern railways raised their interstate passenger fares to 2½ cents a mile, while leaving many state rates at 2 cents, the commission let the higher interstate rates go into effect. These and other developments seemed to indicate not only that the commission looked with disfavor on unremunerative state rates fixed by public authority, but that it might even take the aggressive in attacking them.

The decision in the Western freight rate case seems to show that the commission is not disposed to adopt any such policy. It refused advances in interstate livestock rates, not because they were unreasonable, but because there were corresponding state rates that were lower. Instead of state regulation being compelled by the federal government to conform to interstate regulation, or instead of interstate regulation being carried on regardless of state regulation, state regulation was allowed to exert a controlling influence on interstate regulation.

The *Railway Age Gazette* has criticized the attitude assumed by the commission in this instance as inconsistent and lacking courage. But there is something to be said on the other side. The railways themselves show inconsistency and want of courage when they ask the commission to allow advances in interstate rates, and at the same time fail vigorously to attack state rates which are lower. It is primarily the business of the railways, and not that of the Interstate Commerce Commission, to attack unremunerative state rates. Furthermore, in the long run, it will probably be better that the railways rather than the Interstate Commerce Commission take the initiative in this matter. If the commission goes on letting the roads make interstate rates higher than the corresponding state rates it may become the object of attacks for permitting unfair discrimination against interstate traffic. If it should take the initiative in an attempt to force up the state to the level of the interstate rates it probably would be accused of going out of its way to aid the railways and to attack state regulation. Many persons might suspect and allege that it did this mainly to increase its own power. It seems not improbable that if it should show much aggressiveness in attacking state regulation it might so array the state commissions, state politicians and advocates of state's rights against it as to do harm to federal regulation.

It would seem that in the long run the best and most certain way to get the legislation, or the action by the commission and the federal courts, essential to securing the needed limitation or abolition of state regulation would be for the railways to take the initiative in bringing squarely before the commission and the courts, and if necessary also before Congress, the situation created by unjust state regulation in such a manner as practically to force the federal authorities to assert and exercise their paramount power. This may be done in various ways. For example, there are many state passenger fares which are lower than corresponding interstate passenger fares. There are also some state freight rates that are lower than the corresponding interstate rates. Why should not the railways advance some of these state rates fixed by public authority to the same basis as the corresponding interstate rates, and then when the states proceed against them appeal to the Interstate Commerce Commission for protection on the ground that the states are trying to compel an unjust discrimination against interstate commerce? If the commission should hold that the advanced state rates were reasonable the federal courts, it would seem, could be relied on to uphold the railways in persisting in charging them.

There is no question that in almost every instance where a state rate is being charged which is lower than a corresponding interstate rate an unjust discrimination is being worked against interstate commerce. This is a condition which ought not to be allowed to continue. It is wrong in itself and causes unnecessary and unfair losses to the railways. It would appear that the Interstate Commerce Commission does not intend to take the initiative in attacking this condition. Therefore, it is for the railways to open the attack, and the sooner and the more vigorously they begin it the earlier and the more satisfactorily the problem of regulation will be advanced toward a solution.

NEW BOOKS

Purchasing. By C. S. Rindsfoos, C.E. Bound in cloth; 165 pages; size, 6 in. by 9 in. Published by McGraw-Hill Book Company, Inc., 239 West 39th Street, New York. Price, $2.

This book might well be called a psychological study of the art of purchasing. While it does deal to some extent with the department organization of the purchasing office, its main emphasis is placed rather on the elemental things for which the department is created. This is best explained by a citation of the following chapter heads: How to Obtain the Right Article; How to Obtain the Lowest Price; How to Obtain Prompt Delivery; How to Obtain Favorable Terms, and Strategy. The chapter on some of the Legal Aspects of Purchasing, written by William W. Taylor, is especially valuable, dealing as it does with the contract, the passing of title, etc. Nearly 60 pages of the book are devoted to specimen forms and contracts, thereby making the volume a useful reference book.

Letters to the Editor

THE UNNOTICED UNORGANIZED EMPLOYEES

Redstack, Ark.

To the Editor of the Railway Age Gazette:

The trenchant discussion of "The Rising Wage Differential and Its Cure," signed "Division Engineer," in your issue of June 18, contains many suggestive points for every member of the non-organized class of railway employees, to which class I belong.

During a varied experience of ten years handling a train sheet or a chief despatcher's desk I have never belonged to any protective organization; but there have been many times when I have wondered if I should not be justified in joining six or eight of them if they were available. Everybody in the operating department, outside of the brotherhoods, should think seriously on this subject. The solution proposed would certainly appeal to all non-organized employees. The matter, however, is beyond the province of division officers, and my impression of general managers is that they do not usually consider such radical measures; yet I sincerely hope that some of them may give thought to the letter written by Mr. Division Engineer.

The management of a railroad should see that some supervision is made of the treatment accorded all classes of employees, and that non-organized employees should be accorded protection and treatment that would tend to promote their loyalty, rather than alienate them; or, in other words, induce them to shun, rather than seek, protective organization. Instead of having so many inspectors, minor officers, etc., to see that a man toes the mark all the time, endow at least one officer with authority to see that they are given proper credit for the good that they achieve, and are not criticized too severely for the errors that human beings are bound to make now and then.

For an example: A train despatcher is subject to all the whims and erratic criticisms of not only all the minor officers, but also of their chief clerks. An unjust criticism cannot be designated as such without a man imperiling his means of making a living. Too often a man is hounded for a week over some matter that does not amount to a hill of beans, simply because he overlooked some unimportant paragraph in a bulletin book containing 795 pages of instructions; instructions which he is told he must know by heart. I know of a case where a section foreman—who happened to be the general manager's brother-in-law and was promoted to train master because of his remarkable ability—discharged a train despatcher for sawing a passenger train at a non-telegraph station, regardless of the fact that the saw was directly caused by a drawbar failure.

In such cases, for an employee whose interests are bound solely to the company which he serves, there is no redress. Such things are altogether too common in various division headquarters to need much citing of individual instances. If some self-respecting general manager, who also had some respect for his railroad, would step into some of the offices where I have had the honor of serving, and look over some of the data by which the despatching force were governed, he would no doubt call the janitor to dump it all into a bushel basket and make a bonfire of it; and tell the boys to start over.

Several years ago my employers were threatened with labor difficulties, and the superintendent called each despatcher into the office and impressed upon him the fact that he was considered an officer of the company, and as such would be expected to submerge all his personal interests and give his undivided support and service to the company during the trouble. I am proud to say that every one of us responded nobly to the occasion, although it was exactly what I would have done without any preliminary coaching or reference to my being a member of the official staff. But, a short time later when I requested some courtesies in the way of transportation, I was informed that such were not granted to employees less than three years in service, which was about six months more than I could claim. This was an arbitrary ruling applying to all employees regardless of whether the employee's allegiance was divided between the company and some other institution or not.

I pondered deeply the question whether I was an "official" or not, and if so, what an official consisted of, and came to the conclusion that if I was an official, an official in such cases consisted of at least two-thirds jackass for ever thinking that to dub a despatcher an "official" carried any distinction except when it served the company's interests.

The rooms provided for the despatching force in some instances are not fit for the habitation of swine; their working equipment is dilapidated and consists of pieces discarded by other departments patched together; and their sanitary conveniences—if there are any—are of inferior grade and inconveniently located. Great improvements could be made in this respect on almost any railroad, but if the despatchers were to formulate a petition on the matter, it would be considered rank insubordination.

Let some railway company, as an experiment, create a new office. Select a responsible man with a keen eye and reliable judgment in such matters. Give him some such title as "inspector of methods," a fair salary, and instructions to canvass the system and take up for correction all cases that he may find of unjust criticisms or discipline, criticism or discipline rendered in such a way that it humiliates, insults and angers a man; unfavorable physical working conditions; shirking of responsibility and shifting of responsibility to subordinate shoulders by those who are designated to assume, and expected by the management to assume, that responsibility; and general injustice and arbitrary treatment accorded men who must either submit or resign. He would find enough of it to keep him busy for 365 days in the year.

There are many other ways in which railway companies can serve their own interests by devoting a little thought to the welfare of those employees who do not belong to fraternal orders. I hope to live long enough to see some of them put into operation. If I do not, I know that I shall live—if the life insurance companies guess correctly as to my prospects—to see a great many more men driven into organization in self defense.

Homer Pigeon.

HANDLING OF CLAIMS FOR PERISHABLE FREIGHT

Chicago.

To the Editor of the Railway Age Gazette:

The purpose of this letter is, first, to protest again a practice which is throwing unnecessary expense upon all lines handling perishable freight; and, secondly, to further protest against a growing disposition on the part of the arbitration committees of the Freight Claim Association to settle cases otherwise than in accordance with the rules of the association, and contrary to provisions of the tariffs under which the goods move.

During the last few years several loss and damage claims filed against one commodity, viz., peaches in carloads, have been reviewed. The shipments were handled under stated refrigeration charges and the investigations as a rule developed that the cars failed to maintain schedule; that periods of over 24 hours' duration between re-icing operations were permitted to elapse, and that the condition of the lading on arrival at destination indicated through handling in transit. *There is no published rule to the effect that perishable freight must or should be re-iced every 24 hours.* In fact, the use of such a rule is condemned by transportation authorities.

It has been the practice of many freight claim agents to apportion claims of that description entirely on the refrigeration record, adjudging each road guilty of negligence which had permitted over 24 hours to expire between re-icings, although the freight was in possession of such road during only part of such 24 hours. Freight Claim Association arbitration committees are disposing of appeal cases in the same manner.

Practically all cars of fruit disposed of in Chicago have, at some time between the start of loading and completion of unloading, exceeded the 24-hour limit.

Indications are that bills of lading are made out by railroad agents and re-icing instructions inserted in accordance with some well-defined plan. This is wrong, as the shipper should tender the bill of lading complete for the railroad agent's signature, and, when stated refrigeration charges apply, without icing instructions.

Shipments arrive at destination in bad condition, checking, say, "over-ripe, rotten and mashed," and are taken in charge by consignees, who must pay for all ice furnished at destination and, therefore, have undertaken to regulate the time of icing and amounts supplied. It does not seem reasonable to say that failure to re-ice a car of "over-ripe, rotten and mashed" peaches every 24 hours after arrival at destination, regardless of all other conditions and circumstances, constitutes negligence.

Here is a case in point: A car arrived at destination with ice-boxes three-fourths full and unloading was completed in about 48 hours. It was handled under a tariff which carries the following rules:

> Carriers' obligation to re-ice shipments moving under refrigeration charges ceases on arrival of cars at destination," etc.
> "Upon arrival at destination of carload perishable freight under refrigeration if shipment is not unloaded immediately carriers will see that cars are properly iced and will examine tanks daily, filling to full capacity whenever tanks get below half full."

Nevertheless the terminal road was penalized for exceeding the unwritten and unauthorized 24-hour limit at destination. (Arb. claim A 3345 Appeal Claim No. 566.)

Following is an example of the extremes to which some freight claim agents are going:

A car was loaded at a point on a Western road and bill of lading issued to Pittsburgh, Pa. The initial line erroneously waybilled it to Philadelphia, Pa. In the actual movement it passed through Pittsburgh on schedule. The consignee was not located until three days after the car passed the correct destination and it was then in Philadelphia. In the meantime there was a heavy run of peaches. The markets at both Pittsburgh and Philadelphia became glutted, prices fell and the consignee refused to furnish disposition. On account of the large supply, peaches were being diverted away from the Philadelphia market. This carload was sold by the carrier to the best advantage, but at a loss. No complaint was made on account of their condition. In fact, the record showed the peaches were in good condition. It is clear that the loss was the result of excessive delay caused by the car going astray. The road responsible for the improper billing insisted on a complete investigation of the handling. It was developed that one period of 27 hours had elapsed in transit between re-icings. The 24-hour limit was then introduced and the road responsible for failure to re-ice within the limit was requested to assume 50 per cent of the claim, although damage to the shipment was not claimed.

Tariffs of recent issue provide that where shippers are not satisfied with the standard rule, *i. e.*, "re-ice to capacity at all regular icing stations," they must specify the points where ice is to be furnished and the amounts to be used. Such notations as "Re-ice every 24 hours," "Re-ice when necessary," "Keep fully iced," etc., have been defined by competent authorities as indefinite and unreasonable and their use prohibited by tariff publication. The propriety of the carriers' position in refusing to accept perishable freight with such notations in bills of lading was approved by the Interstate Commerce Commission in a decision rendered last winter (I. C. C. case 6097, Providence Fruit & Produce Exchange v. New York Central & Hudson River Railroad). While this decision is in connection with ice furnished on a rate per ton basis, still it would apply with equal force anywhere that the shipper had a voice in regulating the refrigeration. Carriers should consistently use the same rules they insist on shippers using, viz., standard rules. In view of the fact that carriers may refuse to accept notations described above from shippers on account of their unreasonableness, the same principle should apply when offered by one carrier to another.

Tariffs which publish stated refrigeration charges usually publish certain rules in connection therewith. In the past they have stated in effect that the acceptance of re-icing instructions from shippers was optional with the carriers and even when shippers did furnish instructions they were disregarded. The refrigeration tariffs now carry specific instructions to all agents not to accept re-icing instructions from shippers.

Agents of terminal roads comply literally with re-icing instructions published in tariffs in connection with refrigeration rates and the roads are then adjudged guilty of negligence and penalized accordingly. This is brought about by the arbitration committees of the Freight Claim Association reading the beforementioned unauthorized 24-hour re-icing limit into the rules.

As between penalizing the initial lines for accepting or using instructions such as are prohibited by tariffs, and distributing liability amongst connecting carriers for failure to comply with such instructions, the former would seem to be more reasonable.

The establishing of a 24-hour limit has broadened the field for the "rate sharks" of the country, and even now consignees are requesting carriers to show the exact hour and date of icing in freight bills as well as the names of stations at which cars are re-iced.

It would seem that there can be no excuse for railroads deliberately violating their tariff provisions on the one hand or, on the other, for the committees of the Freight Claim Association to base decisions upon their own precedents instead of upon the tariffs and rules.

JOHN F. BOYLAN.

OFFICERS MUST BE TRAINED IN THE SCHOOL OF EXPERIENCE

KANSAS CITY.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The address of Mr. Basford before a meeting of Burlington officers, published in your issue of July 23, and the supplementary article by Mr. Wright in the following issue, most forcibly portray the fundamental importance of the matter of organization in building up the personnel of the railway service, and make some splendid suggestions that should be very carefully considered by the executives and managers of all railroads. This most important work of conservation of men for posterity has been and is neglected by most railroads; evidently for the same reason that it has been neglected by other corporations, and even our government: i.e., the mad rush for quick returns; the drawing on the bank of futurity; in short, selfishness. On some roads the trouble is due to stock jobbing by the financiers which often has resulted in too frequent changes in management.

Mr. Basford has done a good thing to show up the mistake of putting college or technical men too freely into official positions. The practice, I believe, is still in vogue on some roads. With very rare exceptions the college man has no ballast whatever. Not only is he without experience, he neglects to learn from the experience which is available all around him. Too often he assumes an attitude of superiority that freezes the very sources of confidence, and promotes distrust and suspicion on the part of the rank and file.

Empiricism, in its better sense—true study of experience—has been one of the foundation rocks of every eminently successful career, and the sooner railroad managements realize the fact the better. No man is qualified to be put in charge of men who has not served in the ranks himself.

And even the men who have fairly won their way will at times discriminate in the promotion of men, so there must be a central governing head or body which must make it its business to know that justice is done.

Mr. Basford said a timely word about clerks: "Clerks are a neglected crowd of competent and incompetent men; usually in blind-alley jobs with no training and no outlook." "Blind

alley" here is the right word. The clerk is so busy and so closely confined in his dark alley that he has no acquaintance with officers and is therefore left out of consideration; and even when he makes himself known he is likely to be pushed aside on the pretext that unfortunately he lacks outside experience, etc. My opinion is that officers who got their start as clerks have proved on the whole to be more thorough going and systematic than the man whose experience has been mostly in outdoor jobs.

Is it not possible that the managements have kept so busy for the past few years in dealing with the brotherhoods that their loyal body of clerical men have in consequence been largely overlooked? Is it not also a fact that the outside man who fortunately rubs up against the officers occasionally, is frequently promoted to official position simply through fancy or on account of his coming to notice on account of some one act? Men are promoted without being subjected to a real character or efficiency test. This is wrong.

Some such scheme as Mr. Basford suggests ought to be put in practice. It would help to liberate these loyal clerks, and put a check on nepotism as well as favoritism. As Burke remarked of our forefathers—the rebels of 1776—"Treat men as though they are what you want them to be and they will rise to it; and in no other way." When managements rise to this high plane there will be no need for the numerous committees, "safety first" or otherwise. Intelligent, sincere, loyal men are always safe men, and such men can be evolved only in the way that Mr. Basford points out.

OUTSIDE MAN.

COMMENDING GOOD SERVICE *versus* CONDEMNING BAD

NEW YORK CITY.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I noticed in your issue of August 20, page 361, an account of a "roll of honor" which is kept on the Conemaugh division of the Pennsylvania Railroad, wherein every employee in the train service who has made a perfect record—that is, freedom from suspensions or reprimands—for a year, has the fact made known to other employees by having his name printed on a bulletin.

Undoubtedly every active railroad man will look upon this as a good move. Publishing only the bad and unpleasant things, even when no names are mentioned, does not in all respects satisfy the demands of justice and equity. It is depressing to be constantly reading lessons and trying to absorb the admonitions contained in the lessions. On the other hand it is difficult to formulate and classify the good things that a superintendent feels disposed to say to the employees and so the whole situation remains in a sense unsettled. This attempt to cure the difficulty by means of the honor roll is therefore of general interest. If there must be publicity, it will be a good thing to try, for a time at least, the idea of publishing the good rather than the bad.

But publicity is not the only means of straightening out our discipline. There is a superintendent of a large division, of a large railroad, not a thousand miles from New York, who carries out the same idea as that embodied in Mr. Keiser's honor roll; but without having a roll. He writes an individual letter to each employee who is worthy of commendation. The commendatory statement is not rolled up, neither is it unrolled. It is folded, and put into an envelope. And when the recipient of such a letter unfolds it you can rest assured that he sits up and takes notice. He is not reading a tedious list of names. He has in his hand a statement that is of particular interest to him, himself. When he gets home he shows it to his wife, inside of ten seconds. If there is need of diplomacy—feminine or other—in getting the fact of the receipt of the letter properly circulated among the neighbors he does not need to hunt far for the necessary assistance in that direction.

I give you two or three samples of letters of this kind, slightly disguised:

John Smith, Brakeman,
Dear Sir:

In making a personal examination of your record I find that during the last twelve months no disciplinary action, of any kind, has been taken in connection with your service; no suspension and not even a reprimand. It is a pleasure to note this satisfactory service and I trust that you will succeed in making an equally creditable record during the current year.

Yours truly, ————.

Peter Jones, Engineman,
Dear Sir:

In making a personal examination of your record, I find that no suspensions, reprimands or other disciplinary action have been recorded against your name since January 1, 1913. This satisfactory service for a period of more than two years is evidence of good work on your part, and I shall hope to be able to record, next January, the fact that you have extended the two-year record to three years.

Yours truly, ————.

Benjamin Baker, Conductor,
Dear Sir:

In looking over your record recently I find that no unfavorable disciplinary action has been taken in connection with your service as conductor since January 1, 1912. This satisfactory record for a period of three years may justly be taken as evidence of excellent service; and such excellence is appreciated by the management.

Yours truly, ————.

It will be observed that the style of the letters differs somewhat in proportion to the length of the uneventful record. But, whatever the style, the notable thing is that the superintendent himself does look into the individual records. I think I am safe in saying that results, in the way of a reduction in the number of cases of discipline, are as satisfactory as those reported in your article of August 20, or as reported by other roads which have received mention in your columns now and then as making great advance in the matter stated, but I will not venture to enlarge on this feature of the matter, for the slackening in the volume of freight traffic on most of the roads of the country in recent years makes all comparisons somewhat deceptive. As you have remarked in some of your editorials, the weeding out of the less competent and less cautious men which follows a diminution of freight traffic often results, automatically, in a marked improvement in the service.

C. C.

CONDITIONS THAT NEED CORRECTING

NEW YORK.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

When riding in some of the suburban trains on even our leading railroads, one cannot but wonder at times whether the passenger department does not spend its entire time looking after the interests of the traveling public on only the high-class through trains. On one of the most important suburban trains on a large system operating into New York City, the train crew very frequently permits smoking in day coaches other than the smoking cars, and cases are not infrequent where ladies entering the train have to spread newspapers on the floor between the seats where smokers have been spitting and throwing cigar ends, while window sills are at times covered with ashes knocked from cigars. It is another common occurence on this train for the trainmen to omit the calling of important stations in some of the cars and for passengers to have to open vestibule doors and raise the trap doors because of no trainman being in attendance at that end of the car. Conditions of this kind are a disgrace to any railroad and it is scarcely believable that the officers in charge are aware of their existence.

E. M.

Electro-Mechanical Interlocking at Trenton

Electric Power for Signals, Manual for Switches; No Plunger Locks, No Detector Bars; Novel Locking

By W. M. Post

Supervisor of Signals, Pennsylvania Railroad, Jersey City, N. J.

On account of a change in the arrangement of the tracks of the Pennsylvania at Trenton, N. J., during 1913, the wornout mechanical interlocking of 66 working levers was replaced by an electro-mechanical interlocking, U. S. & S., style P, of 22 working mechanical levers and 28 working electric levers. In considering the type of interlocking to be adopted, it was found that both the installation cost and the maintenance of an electro-mechanical plant would be somewhat less than for other types. The compactness of an electro-mechanical, as compared with a mechanical machine, as shown graphically in Fig. 2, was con-

Fig. 1—Pennsylvania Interlocking at Trenton, N. J.—Looking East

sidered in connection with its operation, and the space saved in the interlocking station. The factor of safety of an electro-mechanical interlocking resulting from the actual mechanical connection between a switch and the lever operating it, and the electrical safeguards which are essential in a power interlocking, applied through the electric levers, was also considered.

The machine is shown in Fig. 3. Indication lights are located below the electric levers to show which track circuits are occu-

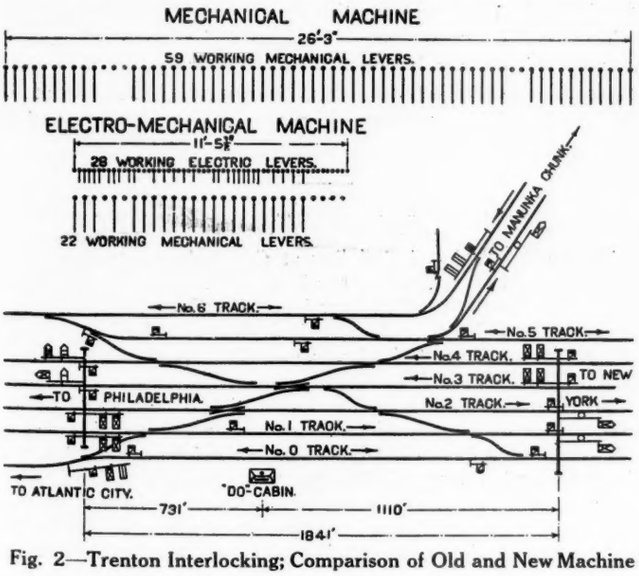


Fig. 2—Trenton Interlocking; Comparison of Old and New Machine

pied. A diagram showing the track layout is mounted directly over the machine, and clockwork slow releases are placed at each end of the machine. Mercury slow releases are connected to levers controlling dwarf signals located close to switches.

The switches are operated through switch and lock movements, eliminating the plunger facing point locks, detector bars, their pipe connections and levers. This somewhat radical departure from general practice for mechanically operated switches has been found safe and practicable on account of the use of the "indicating lock lever" in connection with the mechanical switch lever. As the function of the indicating lock lever may not be generally understood, its operation is described somewhat in detail with reference to Fig. 4.

The indicating lock lever, when normal, locks the mechanical lever normal at A; when the indicating lock lever is on center, the mechanical lever can be moved and the crossover operated; when the mechanical lever is reversed, the indicating lock lever can be moved from center to reverse position, locking the mechanical lever reversed at A, provided the crossover switches

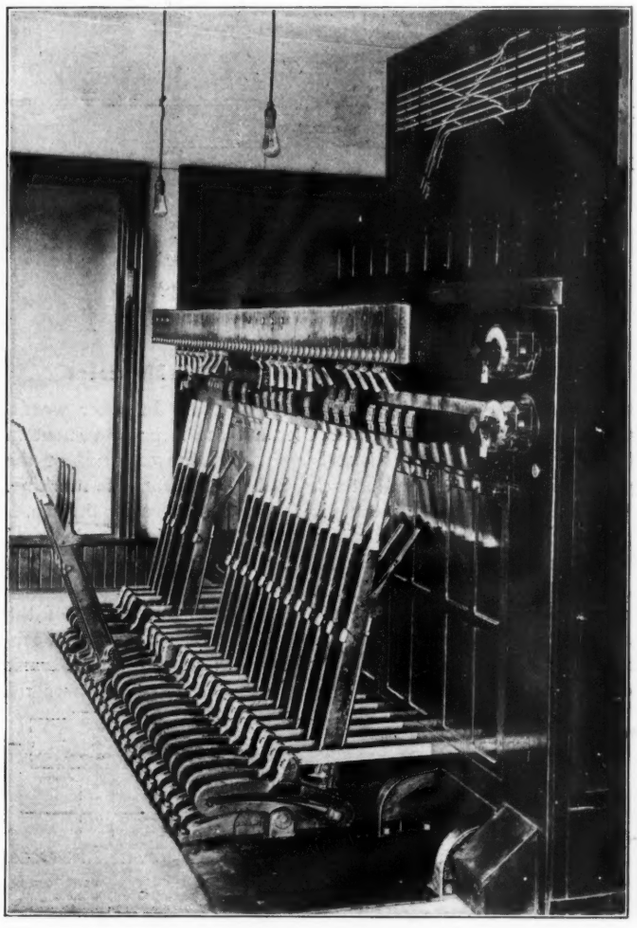


Fig. 3—Electro-Mechanical Interlocking Machine

have responded to the movement of the mechanical lever, are locked, and the indication is received. If the indication is not received, the indication lock lever cannot be moved from its center position, and as this lever actuates the mechanical locking and unlocks signal levers only when its stroke is completed, all signal levers are mechanically locked normal and a proceed signal cannot be given. The detector lock prevents the indication lock lever from being moved from either the normal or reverse positions when the track circuits controlling the crossover are occupied, which, in turn, prevents the mechanical switch lever from being moved because it is locked at A.

It will be noted that all vital parts of the machine, namely, mechanical locking, spring combination, indication and detector locks, are actuated by the small levers, resulting in a minimum amount of wear and strain on these parts. The mechanical lever and the pipe connections are merely to transmit the power applied by the leverman to the switch. A counterweight, W, is applied to the tail levers of the mechanical levers to assist in moving the lever to the normal position. As a leverman can apply more power to move a lever to the reverse position than to the normal, it was found that the addition of the weight evened up the effort on the part of the leverman. It was also found that a switch moves easier during the first part of the lever stroke, and the momentum gathered by the weight while moving the lever about half-way helps to carry the switch to

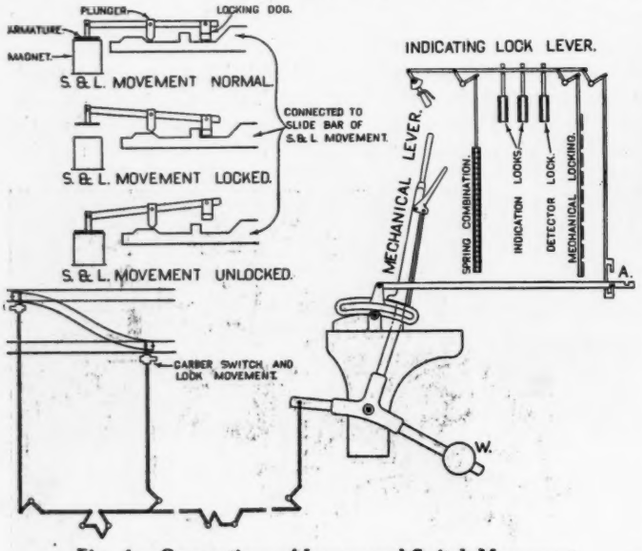


Fig. 4.—Connections of Levers and Switch Movement

the completion of the movement and lock it. In other words, the addition of the weight smoothes out the lever movement in both directions. The furthest crossover at the east end of the plant, between Nos. 1 and 0 tracks, is 1,040 ft. from the machine. It is operated with one mechanical lever and is easily thrown.

The Garber switch-and-lock movement, which was designed for electro-mechanical interlocking, was used for each switch and movable-point frog. The pipe connection to this switch-and-lock movement is in the direction of the movement of the switch, and is operated by a direct thrust or pull on the operating rod of the switch, instead of through an escapement crank or a motion plate. This reduces to a minimum the power re-

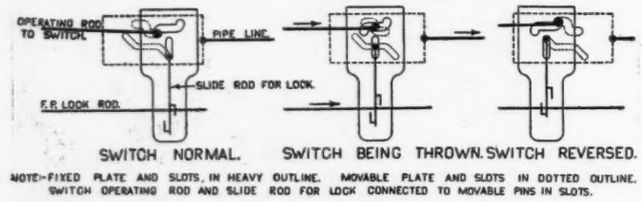

OPERATING ROD TO SWITCH.
PIPE LINE.
SLIDE ROD FOR LOCK.
F. P. LOCK ROD.
SWITCH NORMAL.
SWITCH BEING THROWN.
SWITCH REVERSED.
NOTE—FIXED PLATE AND SLOTS, IN HEAVY OUTLINE. MOVABLE PLATE AND SLOTS IN DOTTED OUTLINE. SWITCH OPERATING ROD AND SLIDE ROD FOR LOCK CONNECTED TO MOVABLE PINS IN SLOTS.

Fig. 5.—Garber Switch and Lock Movement

quired to operate the switch. A diagram showing the mechanical movements for unlocking, throwing and locking the switch, is shown in Fig. 5. A view of this switch-and-lock movement is shown in Fig. 6.

In mechanical and electro-mechanical interlockings, it is possible, although the probability is very remote, that something dragging from a passing train may catch the cross pipe lines and pull a switch open. On account of pipe lines crossing so many tracks at this point, it was thought best to lock electrically the facing point switches which might be pulled open when in the normal position. An electric lock for switch-and-lock movements has been designed to accomplish this. The magnet is de-energized when the indicating lock lever is normal or reversed, and should the pipe line be pulled by something dragging, the first movement of the slide rod would lift the armature and the locking dog would engage the projection on the slide rod, thereby locking the switch movement against further movement. If the indicating lock lever is on center, as is the case when the switch is to be thrown, the magnet is energized, and the first movement of the slide rod would lift the locking dog, allowing the switch to be moved in the usual way.

This electric lock is very rugged. Several tests proved that the pipe line would break should it be caught, and the electric lock still hold and prevent the switch from being pulled open. The same tests were applied on a switch equipped with the usual mechanical connections to see if the plunger lock and lock rod would hold the switch closed if the operating pipe line was

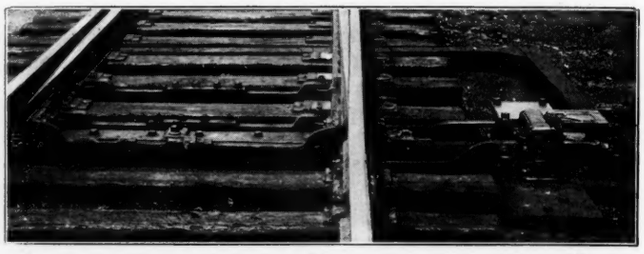


Fig. 6.—Garber Switch and Lock Movement

caught and pulled. The results showed that the front and lock rods bend and the switch can then be pulled open. These locks are only placed on switches where a track intervenes between the switch and the pipe line, and which face the normal direction of traffic. Fig. 4 shows the mechanical movements of this lock.

The electric current is obtained from the 3,300-volt, 60-cycle, underground signal feeders which supply the signal system between Trenton and Holmesburg Junction, about 20 miles. The generators for this system are situated in the pumping station at Bristol, 10 miles from Trenton. Suitable transformers are placed through the interlockings to furnish current for the track circuits and lights. A 14-volt storage battery of 150 ampere hours capacity, charged through a mercury-arc rectifier, furnishes direct current for the signals and indicators.

There are, on an average, 1,350 signal and 1,900 switch movements at this plant each day. The results of two years of service show this type of interlocking to be entirely practicable at a busy point. There are now 44 such plants in service on the Pennsylvania Railroad.

LEHIGH VALLEY'S NEW YORK ORE DOCK

The Lehigh Valley is building at Constable Hook, Bayonne, on New York bay, 5 miles south of the Battery, a long pier which will be the northern terminus of a line of ore-carrying steamships, to be used by the Bethlehem Steel Company to bring iron ore from Chile by way of the Panama Canal. Ore will be brought also from Cuba.

The new pier will be 1,060 ft. long and 67 ft. wide, and there will be a basin 200 ft. wide. A channel which will insure 35 ft. of water at low tide will be dredged. The pier will have four railroad tracks running its whole length, and will be equipped with modern unloading machines, two of them, which can work on one vessel at the same time, each with a maximum capacity of 500 tons an hour, or both together, 300 cars of ore a day.

The site of the new pier adjoins the plant of the Standard Oil Company. Plans of the Bethlehem Steel Company contemplate an annual importation of 750,000 tons of ore from its beds in Chile (Coquimbo). The Chilean deposits of iron ore, grading very high, are said to be the largest known in the world.

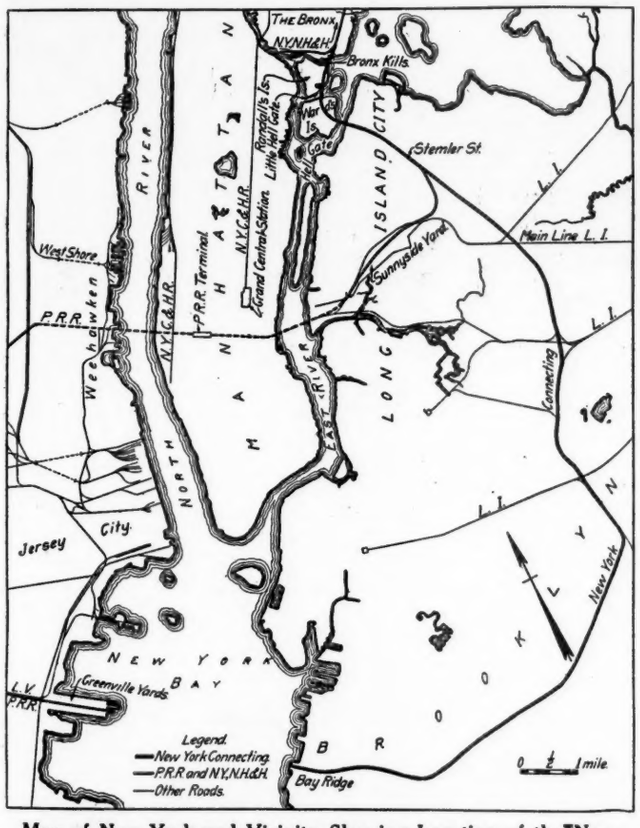
The foundation of the pier includes a section of cribbing work 710 ft. long and 46 ft. wide.

Construction of the New York Connecting Railroad

Material Progress Is Being Made on the Ten-Mile Line Which Will Connect the Pennsylvania and New Haven

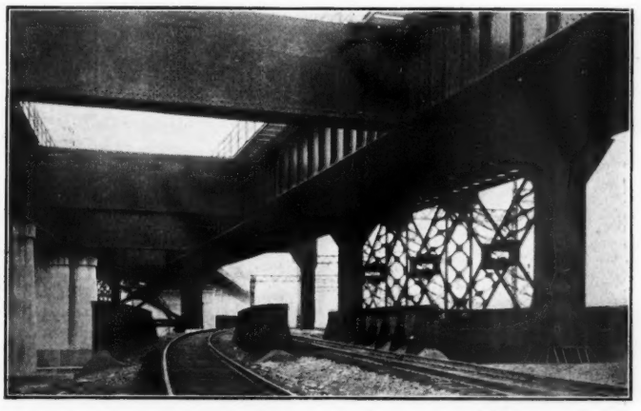
Encouraging progress is being made on the East River Bridge division of the New York Connecting Railroad. All masonry work has been completed except the top portions of the abutments of the 1,000-ft. Hell Gate arch and the neat work of several viaduct piers on either side of the latter, which would interfere with the erection of the arch and which cannot be built until after it is completed. The erection of the four inverted bow-string trusses of the Little Hell Gate bridge and of the Hell Gate arch bridge is now in progress, all other portions of the steel work of the three and one-half miles comprising this section being now in place except the girders of the Ward's Island and Long Island viaducts, most of which are in temporary use in the back stays for the erection of the 1,000-ft. arch.

From the standpoint of the magnitude of the expenditure, together with the formidable character of the engineering problems involved in the accomplishing of a definite strategic purpose, this project compares favorably with the entrance of the Pennsylvania on Manhattan island. An account of this undertaking, together with a record of the earlier progress on the various structures, was given in the *Railway Age Gazette* on November 13, 1914.



Map of New York and Vicinity, Showing Location of the New York Connecting Railroad

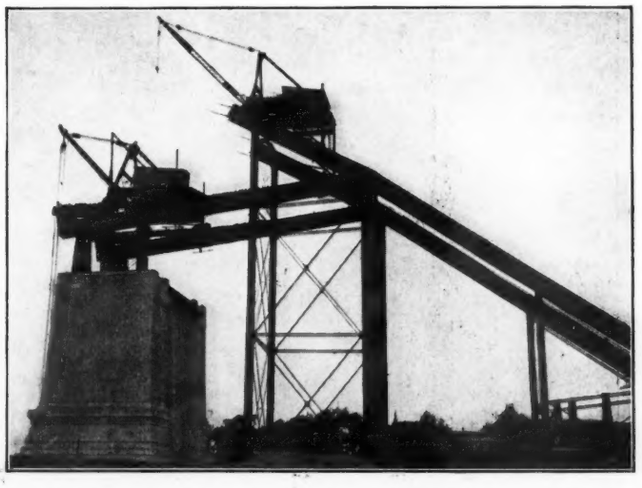
The four-track line of the New York Connecting Railroad leaves the New Haven's Harlem River branch at One Hundred and Forty-second street, in the Bronx, crosses Bronx Kills to Randall's Island, then crosses Little Hell Gate to Ward's Island, then turns sharply to the left across Hell Gate to Long Island on an arch bridge having the longest span in the world. A connection is made in Long Island City with the Pennsylvania system, through the Sunnyside yard. Passenger trains will use this connection, passing under the East river to Manhattan island and under the Hudson river through the Pennsylvania tunnel to connect directly with the main line for the West. A double-track freight line will leave the passenger line at Stemler street, Long Island City, the southern end of the East River Bridge division, and will continue east and south to a connection with the old Manhattan Beach road of the Long Island system near Fresh Pond Junction. The freight line then continues over the Long Island branch to Bay Ridge, directly opposite the Greenville (N. J.) freight yards of the Pennsylvania, with which there is connection by means of ferries. A contract for the construction of the new work on the freight line has recently been let to the Wilson & English Construction Company, New York, and to P. McManus, Inc., Philadelphia.



Skew Crossing of New York Connecting Tracks Over New Haven Tracks in the Bronx

THE BRONX AND RANDALL'S ISLAND VIADUCTS

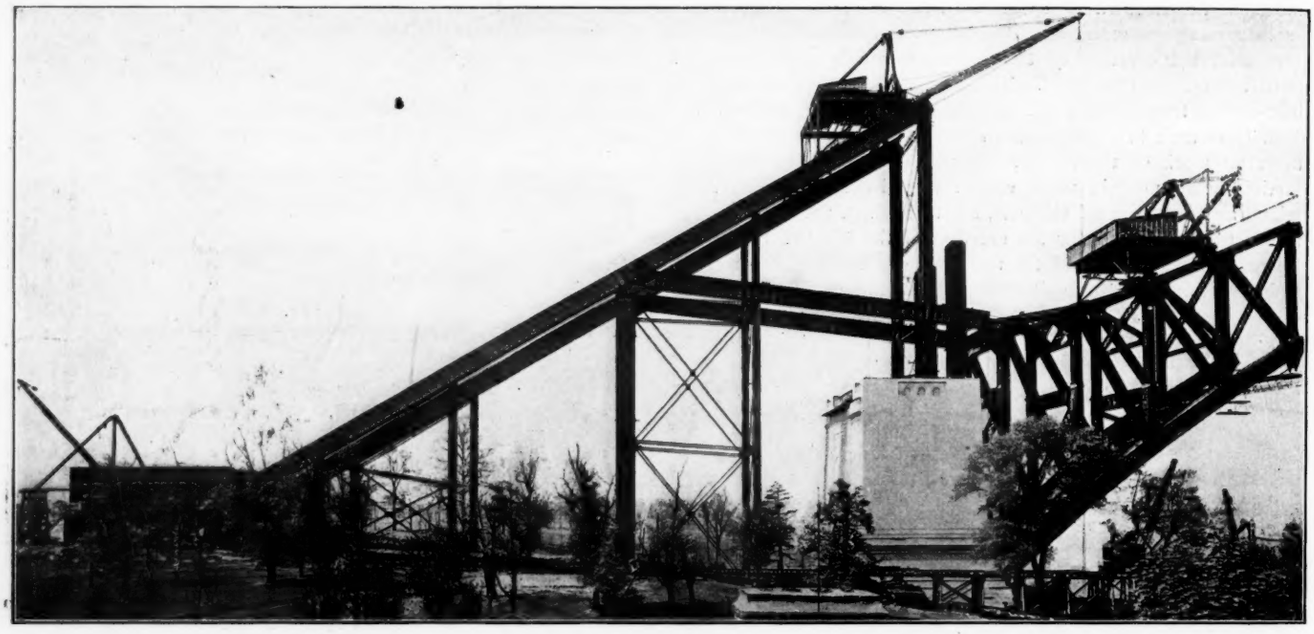
The four New York Connecting tracks join the four New Haven tracks at One Hundred and Forty-second street in the Bronx, the New Haven tracks being spread to allow two new tracks to be located in the middle. The other two new tracks are constructed on the east side of the old line, all four tracks being laid on an earth fill between retaining walls as far south as One Hundred and Thirty-eighth street. From that point to One Hundred and Thirty-second street, where the difference in elevation between the new and the old tracks is too great to allow



West Abutment of Hell Gate Arch, Showing Stayback Structure

the use of the retaining walls and earth embankment, rectangular concrete piers are used under each of the two double-track portions of the line, which carry 64-ft.-deck girder spans.

The girders are provided with ballast floors, I-beams spanning transversely across the girders and imbedded in concrete, forming the support for the ballast. The top flanges of the girders are equipped with what are known as dam angles, one being riveted to each edge to form a channel-shaped trough for the reception of the concrete. The I-beams of the floor are supported over these channels on small cast-iron blocks, while clip angles riveted to the beams and to the dam angles secure the beams rigidly in position. Every third beam projects beyond the edge of the concrete imbedment to support plank walks between and outside the tracks, the outside walks being protected by iron pipe railings.



Hell Gate Arch, East Abutment and Backstay. First Set of Ties in Position

Between One Hundred and Thirty-second and One Hundred and Thirty-third streets the New Haven tracks curve to the right to follow westward along the north shore of Bronx Kill. In consequence it is necessary for the two inside connecting tracks to cross over the two easterly New Haven tracks on a very flat skew. The manner of handling this problem is shown in the accompanying photograph. No change from the standard construction is made for the two east connecting tracks, nor is the span length of the girders for the two west tracks modified. The girders are supported at their ends by heavy double-webbed cross girders, in turn supported on the east by the piers for the east tracks and on the west by heavy section columns placed between the two east and the two west New Haven tracks. The girders in the lower foreground carry the New Haven tracks over One Hundred and Thirty-third street. The vertical cross bracing on the right is not a truss, but serves as longitudinal sway bracing to take the traction forces from the tracks overhead. A rocker column is shown in the distance.

In the Bronx, south of the skew crossing, and on Randall's Island, the viaduct girders are carried on piers consisting of two heavy shafts or columns connected by an arched diaphragm or girder. The piers vary from 50 to 90 ft. in height. On Randall's Island the girders are from 80 to 87 ft. in length, the details corresponding very closely to those in the Bronx Viaduct. The girders for the two center tracks were erected first, and with

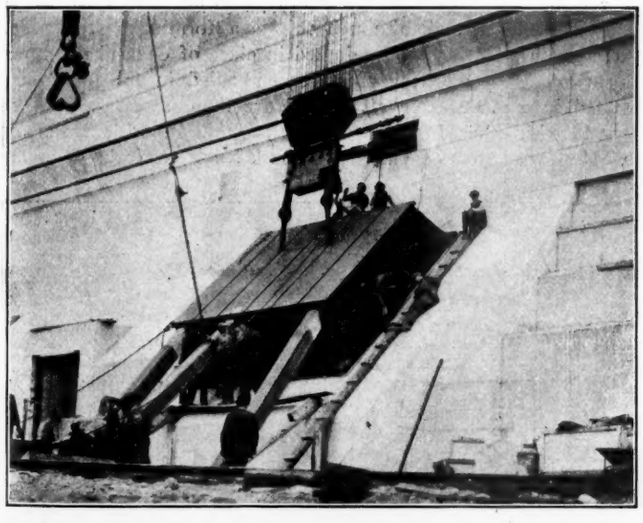
Progress on the Erection of the Hell Gate Arch. Second Set of Ties in Position on the East Side

tracks in place on these an opportunity was afforded for very rapid erection of the girders for the outside tracks, a condition of which the erectors took advantage, as witnessed by the attainment of a record for steel erection, 1,500 tons in a period of six and one-half hours. The equipment consisted of a 68-ton capacity derrick car and a 50-ton capacity locomotive crane, which worked facing each other on one center track while the girders were delivered on cars on the other. The girders arrived completly riveted up in pairs, forming a complete span which weighed about 87 tons.

THE HELL GATE BRIDGE

The most important feature of the entire project is the 1,000-ft. span steel arch over Hell Gate, noteworthy among the world's greatest bridges as the longest steel arch and as a structure of unusual proportions, designed for four railroad tracks with concrete ballast floors. It consists of two spandrel-braced, two-hinged trusses, 60 ft., center to center, with chords separated vertically 140 ft. at the springing line and 40 ft. at the crown. The rise of the bottom chord is 220 ft. and the roadway, between chords at the springing line and suspended below the bottom chord in midspan, is 135 ft. clear above high tide. The abutments consist of monumental masonry towers of great size and weight to give the necessary verticality to the resultant thrust on the foundation, particularly on the Ward Island side, where the rock surface is from 58 to 120 ft. below the ground level. In all, 19,000 tons of high-carbon steel are required. The structure is characterized by the unusual proportions of many of the details. Rivets are 1¼ in. diameter, many of them 11 in. long. The bottom chord consists of a double rectangular section having a uniform width of 6½ ft. with a depth varying from 11½ ft. at the springing line to 7½ ft. at the crown and involves the use of webs 2 in. thick. The maximum total stress is 28,650,000 lb., for which a section of 1,385 sq. in. is provided. The top chord consists of built-up I-beams 48 in. deep, spaced 60 in. apart, with cover plates on top and angle-bar lacing on the bottom.

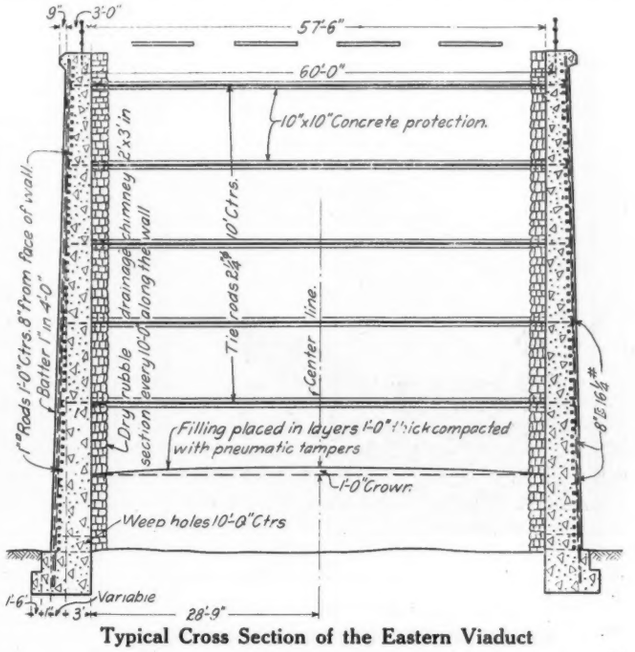
A feature of particular note is the floor. The eight lines of



Erection of First Section of the North Pedestal of the West Abutment

stringers for the tracks and the four lines of stringers for the cantilevered sidewalks are supported by floor beams spaced 42½ ft. apart, eight of which are riveted to members of the arch trusses and the remaining 16 suspended below the bottom chord by box-shaped hangers to which the beams are attached by pins 16 in. in diameter. These suspended beams are 93 ft. long, 9 ft. deep over all in the middle and consist of two plate girders with webs 24 in. apart, covered top and bottom by 48-in. cover plates. They weigh 86 tons each. As the floor is not located between the chords of the trusses it is necessary to provide a horizontal truss in the plane of the floor to take care of the traction and braking forces. This traction truss will transmit its load to the bottom chord at the third panel point, where the bottom chord and the floor intersect by means of horizontal traction girders 8 ft. deep riveted between the chords.

The fabrication and erection involve many unusual conditions. There are gusset plates 10 ft. by 17 ft. by 1⅝ in. thick. Some of the members are heavier than any previously handled in structural steel erection. The largest section of the bottom chord weighs 185 tons, ready to erect. However, the gusset plates are of such dimensions as to preclude their shipment assembled with the section, so the weight of the pieces as shipped was 150 tons.



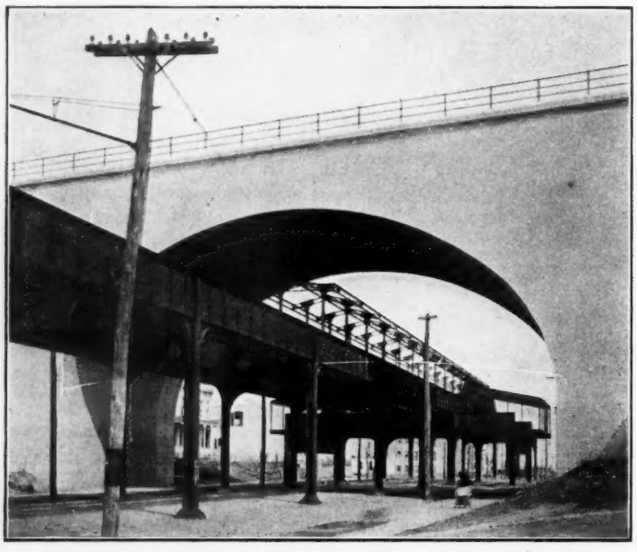
Typical Cross Section of the Eastern Viaduct

In order to make sure of correctness of shop work the arches were assembled in a horizontal position in the shop yard, an operation which had to be performed in several stages because the shop yard was too small to permit the entire arch to be assembled at one time. Rivet holes for the chord splices were drilled out of the solid while the pieces were in the assembled position.

The structure is being erected by cantilevering from the towers by means of backstay structures built behind them, which are shown in the accompanying photographs. These and the counterweights at their extremities consist almost entirely of material to be used in the Long Island and Ward's Island viaducts and of stringers and hangers of the arch structure. These backstays stand on natural foundations with bearing pressures not exceeding five tons per square foot, save in one case on Ward's Island, where piles were necessary. The footings are of timber under I-beam grillages. Directly upon these footings are placed four lines of girders continuous from the piers to the counter-weight, which are provided to take the horizontal component of the backstay pull. On these are placed the columns, consisting of girders and railroad floor stringers. All members of the backstay structure which will be used eventually in the permanent bridgework are designed to require little modification after the temporary use has been completed. All members used in compression as columns or struts have been provided with milled ends. The members used in tension are provided with extensions to allow for bolted splices which can be cut off with an oxy-acetylene flame after the arch is completed. Several angle connections are made by special structural parts which will be discarded after the work is completed. Most of the sway bracing is for temporary use only.

In order to permit erection of the arch by the method chosen it has been necessary to stop the masonry of the towers temporarily at the level of the tracks. The backstay structure was

erected by means of a stiff-leg derrick set on a platform with long legs in the rear to permit it to stand on and advance up the inclined plane of the backstay as the erection progressed. When the work had advanced to the stage shown in the photograph of the west abutment, the erection traveler was set up on the first tie of the back stay directly over the top of the abutment in the position shown. It was then ready to proceed immediately with the erection of the arch. The general method followed is shown in the photograph of the east abutment. The



Debevoise Avenue Arch, Long Island Eastern Viaduct

erection had just been completed to the sixth panel point, one short of the point for attaching the second set of ties. The first set of ties is shown in position over the front face of the abutment, temporary I-beams being used to make the connection between the backstays and the ends of the top chords of the arch. With the traveler off the arch the other derrick can proceed with the completion of the top of the backstay to make ready for the second tie. In a third photograph, showing later progress on both cantilevers, the second ties are seen in position on the east side.

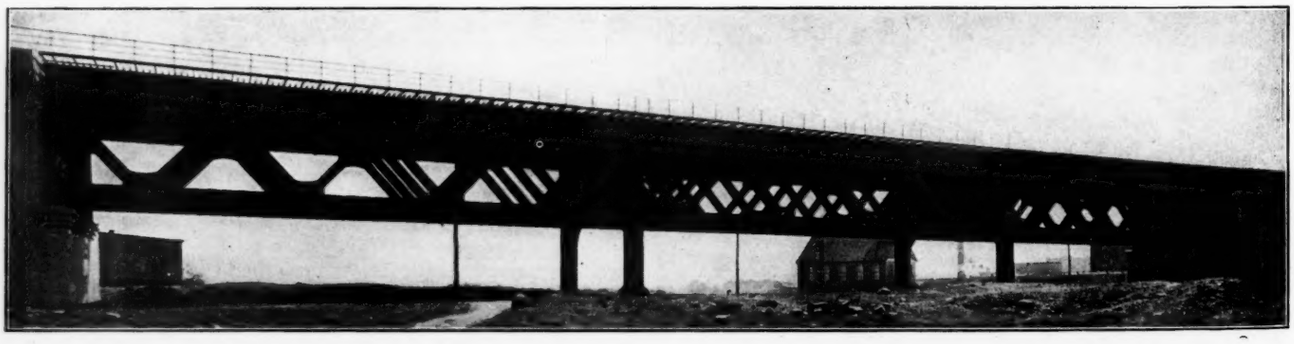
The traveler consists of a stiff-leg derrick on a platform supported on a tower carried on fur-wheel carriages rolling on tracks laid on the top chord. The rear of the traveler is raised or lowered to keep the platform level with the varying inclination of the top chord by means of pin holes set at various elevations in the rear legs.

The arch will be erected as a three-hinged structure. The ends of all bottom chord sections are milled to give bearing on the middle third of the section only, the complete joint being made by splices riveted to from 60 to 80 per cent of the strength of the section. The crown joint will be left unriveted to serve as a hinge until all the dead load has been applied, after which the splices will be completed to make a two-hinged arch for live loading. It has been necessary to provide considerable allowance for deformation for the structure during erection. The length of all arch members has been corrected for dead load stress, while the tower of the backstay is tilted backward so that the elongation of the long tension members will bring it to a vertical position when the full load is applied. Frequent observations are taken for the deflection of the panel points of the arch ring, and as these are inaccessible to direct measurement or leveling it is necessary to determine their absolute position by triangulation from base lines at the foot of each abutment, perpendicular to the axis of the bridge.

A photograph shows the erection of the first section of the north pedestal for the west abutment. This weighs 117 tons and is composed of six separately-cast sections bolted together. The complete pedestal consists of three tiers, weighing in all 275 tons. The upper face of the top tier forms a seat for the cast shoe on the end of the bottom chord, the shoe having a slightly curved bearing face to form a hinged joint. As the great weight of this pedestal is carried on the steep slope of the skewback it must be supported by tie-bars projecting from the abutment until the full arch thrust is obtained. These tie-bars connect by means of pins to ears projecting from the rear of the top section of the pedestal and will be cut off after the arch has been fully erected. The maximum bearing of the pedestal on the skewback, which is of granite masonry, is 800 lb. per sq. in. Material is delivered to the site on car floats and is unloaded by a derrick to cars standing on temporary tracks.

THE EASTERN VIADUCT

East of the Long Island viaduct, which extends for 2,868 ft. east of the Hell Gate bridge, there is a structure 3,480 ft. long known as the Eastern viaduct. This consists of an embankment between vertical retaining walls, interrupted at the intervening streets by concrete arches and steel bridges and embodies a number of special features. The tracks are from 35 to 60 ft. above the street level, and, although this is a formidable height for retaining walls, they were adopted in place of open-viaduct construction because certain features embodied in the design resulted in a more economical structure than it was possible to obtain with other designs. The walls are 3 ft. thick at the top with a face batter of 1 in 40, the back being vertical. They are



Potter Avenue Crossing, Long Island Eastern Viaduct

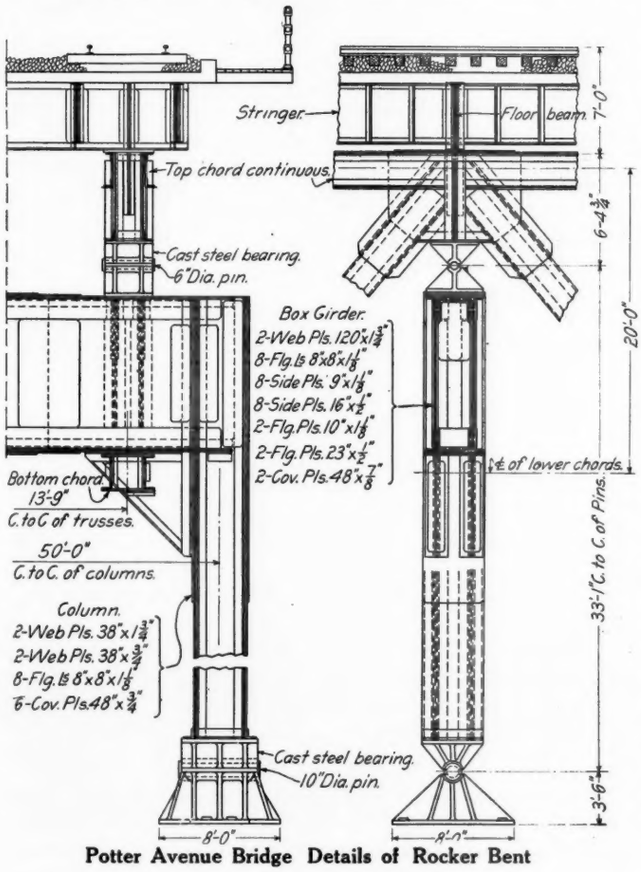
tied together through the fill, giving a form of construction similar to the reinforced concrete U-abutments frequently used by some railroads. However, as the walls are 57½ ft. apart the concrete protection for the tie rods, as ordinarily placed in the form of cross walls, would have added a large volume of concrete, which would require heavy reinforcement for flexure on account of the heavy superimposed four-track load and the wide span. This has been avoided by the use of a special form of construction made possible by careful preparation of the filling

which insures almost absolute security against settlement and has also permitted a large reduction in the assumed lateral earth pressure in design.

The transverse ties consist of 2¼-in. diameter steel rods spaced 10 ft. centers, both vertically and horizontally and anchored at each end to horizontal and vertical 8-in. 16¼-lb. channels through their intersection. The channels are imbedded in the walls 6 in. from the exterior faces. The walls are reinforced in addition by 1 in. square horizontal rods, spaced 1 ft., center to center vertically between the horizontal channels. The tie rods are protected by a covering of concrete 10 in. square, except that every 70 ft. along the viaduct one vertical tier of the rods is enclosed in a solid transverse wall, which serves as a diaphragm to give the structure the desired transverse stiffness and divide it into convenient units for filling.

The filling is a natural mixture of sand and clay obtained from a shovel cut in the Sunnyside yard of the Pennsylvania, three and one-half miles distant, a material which stood practically vertical in the cut. It was concluded that if this material could be placed in the fill as compactly as it was found in its natural state there would be ample insurance against settlement, and if proper precautions were taken to provide drainage a material reduction in the assumed lateral earth pressure for the design of the walls would be justified.

The fill was placed in layers 1 ft. thick, with a crown of 1 ft.



Potter Avenue Bridge Details of Rocker Bent

in the width between the walls and was rammed in place by Ingersoll-Rand foundry tampers. In general the tamping was conducted by shifting the tools one-half the width of the hammer face with each blow, so that an equivalent of two blows on each square inch of the area was obtained. The result was a surface that would scarcely take an impression from a boot heel and the filling was made so compact that the volume measurements in place agreed to within less than 1 per cent with the measurements in the cut. Simultaneous with the placing of the fill, drainage chimneys were built along each wall over weep holes piercing the walls every 10 ft. at the level of the natural ground surface or established grade. These consisted of rubble stones piled up loosely to give a 2-ft. by 3-ft. cross section and carried to the top of the walls. The concrete protection for the tie rods was placed as the filling was brought up to the level of the rods. The fill was delivered in trains consisting of eleven 3.8-yd. capacity dump cars handled by a dinky engine. These were moved over the structure on trestle work supported by transverse timber trusses, the bottom members of which extended only 20 ft. below the top of the wall, thus avoiding the burial of any appreciable amount of timber work in the fill.

The viaduct is pierced by a number of concrete subways spanning the entire width of the street with simple concrete arches, all of which are on a skew and semi-circular in section, except the ones over Debevoise avenue and Stemler street, which are flat arches. The arches in all cases are reinforced concrete rings supported on abutments consisting, except in the case of Debevoise avenue and Stemler street, of thin-faced walls braced by deep counterforts. The viaduct structure, including the arches, is built monolithic without expansion joints, sufficient steel having been provided in the side walls to take care of temperature changes.

In addition to the seven arch subways there are three steel-deck truss structures crossing one or more streets on sharp skews, where the arches would have been impracticable. The line crosses Potter avenue, a street 80 ft. wide, at an angle of about 20 deg., resulting in a structure consisting of three 135-ft. spans, the intermediate support being provided by two rocker bents of two columns each, each having one column in the center of the street, the other column in each case standing outside of the street line on opposite sides. The superstructure consists of a Warren riveted truss having a top chord continuous over the top of the bents from end to end of the bridge, with an expansion joint at one abutment only. For this reason the bents act as rockers, the truss load being applied on top of the cross girders through heavy cast-steel pin bearings, while the columns are supported at their bases on cast pedestals equipped with 10-in. pins. The bents are of very heavy construction, consisting of heavy box-section columns made up of built-up I-beams connected by cover plates on both sides. The box girders which carry the load of the four trusses to the two columns are 10 ft. deep, with heavy double diaphragms at each truss concentration. Fillet brackets, 7 ft. on a side, stiffen the connections of the girders to the columns.

The floor system consists of floor beams and stringers resting on the tops of the top chords. The stringers have their top flanges level with the tops of the floor beams to facilitate the use of a solid concrete floor designed for ballast track construction. A plank sidewalk, protected by a pipe hand railing, is provided on either side of the four tracks.

A two-span deck truss structure has been provided at Frankfort and Steinway streets, and a four-span deck structure between Albert street and Flushing avenue. These are similar in design to the structure at Potter avenue, except that the intermediate supports are masonary piers to which the load is applied from the bottom instead of the top chord. Consequently, the bottom chords are continuous from end to end of the structure, instead of the top chords.

The American Bridge Company has the contract for fabricating and erecting the arch bridge and the Long Island and Ward's Island viaducts. The McClintic Marshall Construction Company furnished and erected the other viaducts and the Bronx Kills bridge, and is now erecting the Little Hell Gate bridge. All the work on the East River division is under the direction of Gustav Lindenthal, chief engineer; O. H. Ammann, assistant chief engineer, and H. W. Hudson, construction engineer, New York Connecting Railroad.

VALUATION OF RAILROADS IN WYOMING.—The Wyoming State Board of Equalization has fixed the total assessed valuation of all railroads in the state for 1915 at $55,120,350, an increase over the valuation of last year of $3,235,110.

RULES FOR INSPECTION OF LOCOMOTIVES AND TENDERS

As noted in the *Railway Age Gazette* of August 20, page 357, a conference of representatives of the railways, of the Bureau of Locomotive Boiler Inspection and of organized labor was held August 23 to discuss the rules and instructions for the inspection and testing of steam locomotives and tenders submitted by the Bureau of Locomotive Boiler Inspection. Sixty-one rules were considered and all but rules 18, 29 and 31 were finally so drafted that they were accepted by the representatives of the railways subject to the final approval of the railways themselves. All of the rules are published in Bulletin 70, recently issued by the Special Committee on Relations of Railway Operation to Legislation. These rules will be presented to the Interstate Commerce Commission by the Bureau of Locomotive Boiler Inspection for acceptance. The railways will probably present substitute rules for rules 18, 29 and 31. The following is a list of the more important rules, those printed in italics being the rules not accepted by the representatives of the railways:

Rule 1.—The railroad company will be held responsible for the general design, construction and maintenance of locomotives and tenders under its control.

Rule 2.—The mechanical officer in charge, at each point where repairs are made, will be held responsible for the inspection and repair of all parts of locomotives and tenders under his jurisdiction. He must know that inspections are made as required, and that the defects are properly repaired before the locomotive is returned to service.

Rule 4.—Each locomotive and tender shall be inspected after each trip, or day's work, and the defects found reported on an approved form to the proper representative of the company. The form is shown herewith:

Locomotive { Number ..... Initials .....

..... Railroad.

DAILY LOCOMOTIVE INSPECTION AND REPAIR REPORT.

Instructions.—Each locomotive and tender must be inspected after each trip or day's work and report made on this form whether needing repairs or not. Proper explanation must be made hereon for failure to repair any defects reported, and the form approved by foreman before the locomotive is returned to service.

Inspected at.....time .....m.

Date.....:191

Repairs needed:

.....

.....

.....

.....

.....

.....

.....

Condition of injectors?..... Water glass?.....
Condition of gauge cocks?..... Brakes?.....
Condition of piston rod and valve stem packing?.....
Safety valve lifts at.....lbs. Seats at.....lbs.
Main reservoir pressure.....lbs. Brake pipe pressure.....lbs.

Signature .....
Occupation .....

The above work has been performed, except as noted, and the report is approved.

..... Foreman.

Note.—Additional items may be added to this form if desired.

Rule 5.—* * * * Locomotives built subsequent to January 1, 1916, shall have the ash pans supported from mud rings or frames. Locomotives built prior to January 1, 1916, which do not have the ash pans supported from mud rings or frames shall be changed when the locomotive receives new firebox. * * * * No part of ash pan shall be less than 2½ in. above the rail.

BRAKE AND SIGNAL EQUIPMENT

Rule 7.—The compressor or compressors shall be tested for capacity by orifice test as often as conditions may require, but not less frequently than once each three months. The diameter of orifice, speed of compressor and the air pressure to be maintained for compressors in common use are given in the following table:

Maker.	Size compressor	Strokes per minute	Dia. of orifice (inches)	Air pressure maintained
Westinghouse	9½	70 complete	9/64	To within 5 lb. of the adjustment of the low-pressure governor.
Do.	11	70 complete	11/64	
Do.	8½ C.C.	70 complete	9/64 & 11/64	
New York	2a	100 single	3/16	61 lb.
Do.	6a	100 single	7/32	62 lb.
Do.	5b	100 single	5/16	50 lb.

Rule 8.—Every main reservoir before being put into service and at least once each 12 months thereafter shall be subjected to hydrostatic pressure not less than 25 per cent above the maximum allowed air pressure. The entire surface of the reservoir shall be hammer tested each time the locomotive is shopped for general repairs, but not less frequently than once each 18 months.

Rule 10.—Distributing or control valves, reducing valves, triple valves, straight-air-double-check valves, dirt collectors and brake cylinders shall be cleaned and brake cylinders lubricated as often as the conditions require to maintain them in a safe and suitable condition for service, but not less frequently than once each six months.

Rule 12.—The minimum piston travel shall be sufficient to provide proper brake shoe clearance when the brakes are released. The maximum piston travel when locomotive is standing shall be as follows:

Cam type of driving-wheel brake	3½ in.
Other forms of driving-wheel brake	6 in.
Engine truck brake	8 in.
Tender brake	8 in.

Rule 14.—Main reservoir leakage shall not exceed an average of 3 lb. per minute in a test of 3 minutes duration. Brake pipe leakage shall not exceed 5 lb. per minute. Brake cylinder leakage shall not exceed 5 lb. per minute per cylinder from an initial cylinder pressure of 50 lb.

Rule 15.—The train signal system, when used, shall be tested and known to be in safe and suitable condition for service before each trip.

CABS, WARNING SIGNALS, AND SANDERS

Rule 16.— * * * * Road locomotives used in regions where snowstorms are generally encountered shall be provided with what is known as a "clear-vision" window, which is a window hinged at the top and placed in the glass in each front cab door or window. These windows shall not be less than 5 in. high, located as nearly as possible in line of the enginemen's vision, and so constructed that they may be easily opened or closed. * * * *

Rule 18.—Each locomotive shall be provided with a bell, so arranged and equipped that it may be operated from the engineer's cab by hand and by power. (Rule 18 objected to by the Committee representing the Carriers.)

DRAW GEAR AND DRAFT GEAR

Rule 22.—The draw gear between the locomotive and tender, together with the pins and fastenings, shall be maintained in safe and suitable condition for service. The pins and drawbar shall be removed and carefully examined for defects not less frequently than once each three months. Suitable means for securing the drawbar pins in place shall be provided. Inverted drawbar pins shall be held in place by plate or stirrup. * * * * Lost motion between locomotives and tenders not equipped with spring buffers shall be kept to a minimum, and shall not exceed ½ in. * * * *

DRIVING GEAR

Rule 25.—Crossheads shall be maintained in a safe and suitable condition for service, with not more than ¼ in. vertical and 5/16 in. lateral play between crossheads and guides.

Rule 28.— * * * * Autogenous welding of broken or

cracked main and side rods not permitted. Bearings and bushings shall so fit the rods as to be in a safe and suitable condition for service, and means be provided to prevent bushings turning in rod. Straps shall fit and be securely bolted to rods. The total amount of side motion of rods on crank pins shall not exceed ¼ in. On locomotives used in road service the bore of the main rod bearings shall not exceed pin diameters more than 3/32 in. at front end, or 3/32 in. for back end. The total lost motion at both ends shall not exceed 5/32 in. The bore of side rod bearing on main pin shall not exceed pin diameter more than 3/16 in. * * * *

LIGHTS

Rule 29.—Each locomotive used in road service between sunset and sunrise shall have a headlight which will enable persons with normal vision in the cab of the locomotive, under normal weather conditions, to see a dark object the size of a man for a distance of 1,000 *feet or more ahead of the locomotive; and such headlights must be maintained in good condition. Locomotives used in road service, which are regularly required to run backward for any portion of their trip, except to pick up a detached portion of their train, or in making terminal improvements, shall have on the rear a head-light which will meet the foregoing requirements. Nothing in the foregoing rules shall prevent the use of a device whereby the light may be diminished in yards and at stations to an extent that will enable the person or persons operating the locomotive to see a dark object the size of a man for* 300 *feet or more ahead of the locamotive under the same conditions as set forth above. When two or more locomotives are used in the same train, the leading locomotive only, will be required to display a head-light. (Rule* 29 *was objected to by the committee representing the carriers.)*

Rule 31.—Each locomotive used in yard service between sunset and sunrise shall have two headlights, one located on the front of the locomotive and one on the rear, each of which will enable persons with normal vision, in the cab of the locomotive, under normal weather conditions, to see a dark object the size of a man for a distance of 300 *ft. or more; and such headlights must be maintained in good condition. (Rule* 31 *was objected to by the committee representing the carriers.)*

RUNNING GEAR

Rule 33.—Driving, trailing and engine truck axles with any of the following defects shall not be continued in service: Bent axles; cut journals that cannot be made to run cool without turning; seamy journals in steel axles; transverse seams in iron axles, or any seams in iron axles causing axles to run hot; or unsafe on account of usage, accident or derailment; main driving, trailing truck or engine truck axles more than one-half inch under original diameter; other driving axle more than three-fourth inch under original diameter.

Rule 34.—Diameter of tender truck axle journals shall be governed by axle loads. The minimum diameter of journals for various axle loads shall be as follows:

Axle load.	Minimum diameter of journals.
50,000 lb.	5½ in.
38,000 lb.	5 in.
31,000 lb.	4½ in.
22,000 lb.	3¾ in.
15,000 lb.	3¼ in.

Rule 35.—Tender truck axles with any of the following defects shall not be continued in service: Bent axle; cut journals that cannot be made to run cool without turning; seamy journals in steel axles or transverse seams in journals of iron axles. or unsafe on account of usage, accident or derailment; collars broken or worn to one-fourth inch or less in thickness; fillet in back shoulder worn out.

Rule 36.—Crank pins shall be securely applied. Shimming or prick punching crank pins will not be allowed. All crank pins allowed after January 1, 1916, shall have the date applied and kind of material used legibly stamped on end of pin. Crank pin collars and collar bolts shall be maintained in a safe and suitable condition for service.

Rule 37.—Driving boxes shall be maintained in a safe and suitable condition for service. Broken and loose bearings shall be renewed; not more than one shim may be used between box and bearing.

Rule 40.—The total lateral motion or play between the hubs of the wheels and the boxes on any pair of wheels shall not exceed the following limits:

For engine truck wheels (trucks with swing centers)	1 in.
For engine truck wheels (trucks with rigid centers)	1½ in.
For tra ling truck wheels	1 in.
For driving wheels (more than one pair)	¾ in

These limits may be increased on locomotive operating on track where the curvature exceeds 20 deg. when it can be shown that conditions require additional lateral motion. The lateral motion shall in all cases be kept within such limits that the driving wheels, rods or crank pins will not interfere with other parts of the locomotive.

Rule 42.—Springs and equalizers shall be arranged to insure the proper distribution of weight to the various wheels of the locomotive; maintained approximately level, and in a safe and suitable condition for service. Springs or spring rigging with any of the following defects shall be renewed or properly repaired: One long leaf or two or more shorter leaves broken; springs with leaves working in band; broken coil springs; broken driving box saddle, equalizer, hanger, bolt or pin.

Rule 43.—The minimum height of flange for driving and trailing wheel tires for locomotives used in road service, measured from tread, shall be 1 in. except for locomotives originally constructed for plain tires when the minimum height of flange on one pair of wheels may be 7/8 in. The maximum taper for tread of tires from throat of flange to outside of tire for driving and trailing wheels for locomotives used in road service shall be ¼ in. and for locomotives used in switching service 5/16 in. The minimum width of tires for driving and trailing wheels of standard gage locomotives shall be 5½ in. for flanged tires and 6 in .for plain tires . . . . When all tires are turned or new tires applied to driving and trailing wheels of locomotives, the diameter of the wheels on the same axle or in the same driving-wheel base shall not vary more than 3/32 in. When a single tire is applied the diameter must not vary more than 3/32 in. from that of the opposite wheel on the same axle. When a single pair of tires is applied the diameter must be within 3/32 in. of the average diameter of the wheels in the driving-wheel base to which they are applied. Driving and trailing wheel tires with any of the following defects shall not be continued in service: Slid flat spot 2½ in. or more in length; flange 15/16 in. or less in thickness, gaged at a point ⅜ in. above the tread, or having flat vertical surface 1 in. or more from tread; tread worn hollow 5/16 in. on locomotives used in road service or ⅜ in. on locomotives used in switching service; flange more than 1½ in. from tread to top of flange.

Rule 46.—Wheels shall be securely pressed on axles. Prick punching or shimming the wheel fit will not be permitted. The diameter of wheels on the same axle shall not vary more than 3/32 in. Wheels used on standard gage track will be out of gage if the inside gage of flanges, measured on base line, is less than 53 in. or more than 53⅜ in. The distance back to back of flanges of wheels mounted on the same axle shall not vary more than ¼ in.

Rule 47.—Cast-iron or cast-steel wheels with any of the following defects shall not be continued in service:

Slid Flat.—When the flat sport is 2½ in. or over in length, or if there are two or more adjoining spots each 2 in. or over in length.

Broken or Chipped Flange.—If the chip exceeds 1½ in. in length and ½ in. in width.

Broken Rim.—If the tread, measured from the flange at a point ⅝ in. above the tread, is less than 3¾ in. in width.

Shelled Out.—Wheels with defective treads on account of cracks or shelled out spots 2½ in. or over, or so numerous as to endanger the safety of the wheel.

Brake Burn.—Wheels having defective treads on account of cracks or shelling out due to heating.

Seams.—Seams ½ in. long or over, at a distance of ½ in. or less from the throat of the flange, or seams 3 in. or more in length, if such seams are within the limits of 3¾ in. from the flange, measured at a point ⅝ in. from the tread.

Worn Flanges.—Wheels on axles with journals 5 in. by 9 in. or over, with flanges having flat, vertical surfaces extending ⅞ in. or more from the tread, or flanges 1 in. thick or less gaged at a point ⅜ in. above tread. Wheels on axles with journals less than 5 in. by 9 in. with flanges having flat, vertical surfaces extending 1 in. or more from the tread, or flanges 15/16 in. thick or less, gaged at a point ⅜ in. above the tread.

Tread Worn Hollow.—If the tread is worn sufficiently hollow to render the flange or rim liable to breakage.

Burst.—If the wheel is cracked from the wheel fit outward.

Cracked tread, cracked plate or one or more cracked brackets.

Wheels out of gage.

Wheels loose on axle.

Rule 48.—Forged-steel or steel-tired wheels with any of the following defects shall not be continued in service:

Loose wheels, loose, broken or defective retaining rings or tires, broken or cracked hubs, plates, spokes or bolts.

Slid flat spot 2½ in. or longer, or if there are two or more adjoining spots each 2 in. or longer.

Broken flange.

Defective tread on account of cracks or shelled out spots 2½ in. or longer, or so numerous as to endanger the safety of the wheel.

Flange worn to 15/16 in. or less in thickness, gaged at a point ⅜ in. above the tread, or having flat vertical surface 1 in. or more from tread; tread worn 5/16 in.; flange more than 1½ in. from tread to top of flange. * * * *

Wheels out of gage.

Rule 51.—Driving and trailing wheels with any of the following defects shall not be continued in service:

Driving or trailing wheel centers with three adjacent spokes, or 25 per cent. of the spokes in wheel broken.

Loose wheels, loose, broken or defective tires or tire fastenings, broken or cracked hubs or wheels out of gage.

TENDERS

Rule 52.— * * * * The difference in height between the deck on the tender and the cab floor or deck on the locomotive shall not exced 1½ in. The maximum width of the gangway between locomotive and tender while standing on straight track shall be 16 in.

Rule 53.— * * * * Not less frequently than once each month the interior of the tank shall be inspected and cleaned if necessary. * * * *

Rule 55.—Tender truck center plates shall be securely fastened, maintained in a safe and suitable condition for service, and provided with a center pin properly secured. Where shims are used between truck center plates the male center plate must extend into the female center plate not less than ¾ in. Truck bolsters shall be maintained approximately level. * * * * Friction side bearings shall not be run in contact. The maximum clearance of side bearings on rear truck shall be ⅜ in. and if used on front truck ¾ in., when the spread of side bearings is 50 in. When the spread of the side bearings is increased the maximum clearance may be increased in proportion.

FILING REPORTS

Rule 58.—Not less than once each month and within 10 days after inspection a report of inspection, Form No. —, shall be filed with the United States inspector for each locomotive used by a railroad company, and a copy shall be filed in the office of the chief mechanical officer having charge of the locomotive.

Rule 59.—A copy of the monthly inspection report, Form No. —, or annual inspection report, Form No. —, properly filled out, shall be placed under glass in a conspicuous place in the cab of the locomotive before it is put into service.

Rule 60.—Not less than once each year and within 10 days after required tests have been completed a report of such tests, showing general condition of the locomotive, shall be submitted on Form No. —, and filed with the United States inspector, and a copy shall be filed in the office of the chief mechanical officer having charge of the locomotive. The monthly report will not be required for the month in which this report is filed.

ACCIDENT REPORTS

Rule 61.—In the case of an accident resulting from failure, from any cause, of a locomotive or tender or any appurtenances thereof, resulting in serious injury or death to one or more persons, the carrier owning or operating such locomotive shall immediately transmit by wire to the chief inspector, at his office in Washington, D. C., a report of such accident, stating the nature of the accident, the place at which it occurred, as well as where the locomotive may be inspected, which wire shall be immediately confirmed by mail, giving a full detailed report of such accident, stating, so far as may be known, the causes, and giving a complete list of the killed or injured.

GREAT ACHIEVEMENTS OF GERMAN STATE RAILROAD LINES

By Frederic William Wile
Author of "Men Around the Kaiser"

The war has been called, at various times, the "trench war," the "motor war" and the "shells war." But, as far as Germany and the German armies are concerned, it is a "railroad war," pure and simple. The amazing ability of the Kaiser's staff and field marshals to fling not only regiments, brigades and divisions, but entire army corps and even whole armies, from East to West and back again from West to East, as emergency requires, is due exclusively to the marvelous system of state-owned railroad lines which honeycomb the fatherland from end to end in all directions. When the history of the war is written the achievements of German railroad men will deserve to be inscribed in letters of red, for the triumphs of the Teuton legions in both the western and eastern theatres of war stand to their credit no less than to the credit of the engineers who built the deadly 42-centimeter howitzer or the strategists of Berlin, who have so skilfully directed the activities of the mighty German war machine.

When regiments which were fighting in Flanders, April 1, are next heard of in Southern Galicia, April 15, or when Germans who were resisting the onslaughts of Joffre's Frenchmen around Arras late in June, pounded at Warsaw on the 4th of July, it means that the lines of communication at the command of the German military authorities have approached something resembling mechanical perfection. We of the United States can perhaps somewhat visualize the problems the German railroad authorities are solving every day if we conjure up the vision of our own country resisting invasion, let us suppose, simultaneously in the Southwest—Texas—and in the Northeast—Maine. The distances with which the German railroad staff must deal are not, of course, as magnificent as those which separate Bangor from Galveston—all Germany is not as large in area as Texas alone—but Germany has expanded, temporarily at least, since last August, for she now occupies five-sixths of Belgium, 25,000 sq. miles of France and 30,000 sq. miles of Russia.* Her railroad system today contemplates an area, one of whose farthermost eastern points is Libau on the Baltic coast of Russia, and which stretches to the west to the Belgian coast of the Channel, and internally to within 50 or 60 miles of Paris.

Put in American terms, the Kaiser's railroad strategists have to concern themselves with an area which embraces, roughly, the states of Ohio, Michigan, Indiana, Illinois, Iowa, Kentucky, Missouri, Wisconsin and Tennessee. I am sure that many an American traffic manager will acknowledge that the job of switching a couple of million armed men, with full artillery

*This article was written in London on July 3.

equipment, back and forth, incessantly, week in and week out, through territory of such ramifications, represents as big a piece of "railroading" as was ever tackled. I heard H. W. Thornton, the gifted and popular American general manager of England's Great Eastern Railway, tell an after-dinner audience not long ago that American traffic managers think they are handling "some traffic" when they successfully deal with a national convention, an Epworth League conclave or a G. A. R. encampment.

I present herewith the official narrative of "The Railway War," as prepared for publication in Germany by the great general staff. It is necessarily somewhat stilted in form, in the English translation, but complete idiomatic rendering of the facts in our own language is almost impossible:

"THE RAILWAY WAR"

"In order to obtain a survey of the preparations for the 'Railway War' one must remember the conditions in Germany during the critical days at the beginning of August, 1914. It was the holiday and tourist season. The large manœuvering grounds in every military district were filled with troops. The freight traffic was normal. Everybody believed till the last moment that peace would be maintained; moreover, war preparations could not, for political reasons, be carried out by the railways.

"War was declared on August 2. Everybody who was away hastened to the railway to reach home before the movement of the military transport began. Relatives visited their sons and brothers to take leave of them before they left for the front. The troops taking part in the manœuvers were sent back to their garrisons as quickly as possible. The mobilization of our armies had to take place partly in the western industrial district. Thousands of long military trains had to be despatched there. By this time the railways had to be cleared of the large number of loaded and unloaded freight cars in order that there might be no hitch in the forward movement.

"At the same time other transport movements began throughout the entire fatherland. Long trains of empty cars and lines of locomotives coupled together were sent to those places where, after careful consideration, cars and engines were greatly needed at the beginning. It is easy for anyone to understand the reason for all this railway traffic. First of all, there was the transport of millions of reservists and 'landwehr' men to their respective posts; then followed the transport of provisions and material for the troops and the armaments for the fortresses. In the districts of Germany which provided the horses, trains ran at specified times in every direction where the full complement of horses was needed as against the number under normal conditions in time of peace. Long trains filled with meat proceeded to the army preserving factories from the districts providing cattle. Finally, from the very beginning of the war there was a constant flow of coal trains from the collieries to the naval ports.

"A very few hours after mobilization there was the first great rush of troop trains. These were filled with men bound for the frontiers in order to guard them against enemy invasion. From day to day this traffic grew until our armies stood at the frontiers and numerous depots behind the first line of troops were filled with provisions, ammunitions, etc. This was, indeed, a great traffic in Germany! The movement of transports was carried out without a hitch. How easily might a very serious accident have happened at any one place on our vast railway system, through human neglect or by criminal hand, which would have seriously delayed the arrival of troops at the frontier! The railway authorities had, therefore, in their primary preparations to take into consideration our geographical position and see where the most vulnerable positions lay. In time of peace trial trains were run to these various positions, so that if war broke out there should be no hitch in the transport of troops. Preparations were made, therefore, for all eventualities.

"The organization of the military railways has already proved successful during the present war. When the commander of a force on the march receives news of the enemy's whereabouts and has to proceed elsewhere, trains are in instant readiness to take him to the scene of operations. The ability of the officers and employees organizing the transport of troops by rail materially contributed to our great successes on the eastern and western frontiers, but their greatest reward was reaped in the latest victories in Galicia.

"The essential condition for the prompt transport and mobility of troops by rail is to have at one's disposal a well-developed railway system. When the mobilization of our armies to the frontiers was complete and the forward march had begun, the chief of the railway section, as 'Chief of the Military Railway Organization,' and his staff proceeded to the field with His Majesty, the Kaiser. From the day of mobilization the relations of the so-called 'military railway authorities' with the German railway administration proper were completely changed. Numerous railways in Germany have since then been amalgamated with the 'war section,' that is to say, the various individual railway administrations are now subject to the orders of the 'Chief of the Military Railway Organization, in respect to everything relating to the running of trains. This chief issues to the railway commando ('working notices') for regulating the war traffic. He has also at his disposal for this work the machinery of the railway section of the great general staff in Berlin.

"To the German railway system were soon added the railway districts in conquered territory. Our troops penetrated very quickly far into the enemy's country, yet, on practically all battlefields the enemy still found time to blow up most of the large bridges and numerous tunnels before retreating. Our railway tracks had, of course, to follow very closely behind the advancing armies, so as not to impede their forward march. This required the prompt repairing and putting into working order the enemy's dismantled railways. To this end, when mobilization took place, two military railway administrations were forthwith formed to organize railway traffic in the conquered districts exactly similar to railway administrations in the fatherland itself.

"One of these two administrations waited at Aix La Chapelle (Germany) for the time when it could proceed to Belgium. The officers of the railway regiments accompanying the first line of troops immediately reported all damage done to lines and buildings entirely deserted by the enemy right into the districts of Hasselt, Louvain, Namur and Marloie. Apart from numerous minor damages, such as tornup rails, overturned engines, etc., thirteen bridges were found blown up, while a tunnel was blocked with several engines which had been made to telescope one another at full steam. Telegraph and telephone wires had been destroyed and all instruments in the stations were rendered unserviceable. Moreover, the railway roadbeds in Belgium in most cases were in a sadly neglected state and the rails were bad. Very often the sleepers broke under the weight of our engines.

"Here our regular railways troops had to commence work. They labored with almost superhuman effort so as to facilitate the bringing up of provisions and ammunition for the advancing armies. Very often long troop trains in close succession had to be brought over these lines, after one line had been cleared, and the working of the stations was taken over by railway officers with a few men. For instance, never before had a German engine been west of Liege until the first train filled with German troops going to reinforce their comrades fighting hard around Brussels ran into the station and had to proceed to Louvain. The lines between Liege and Louvain were repaired one at a time. Staff, there was none. The telegraph and telephone communications between the stations had not yet been restored. Nevertheless, train after train proceeded to Louvain and the empty trains returned the same way. Although the trains were fired on from the houses by the infuriated population and continual cowardly attacks were made, the troops were brought up in time against the enemy and could still participate in the deciding victory. The repairing and putting in order of the railways

proceeded little by little. On September 1 the military railway administration arrived in Brussels and proceeded to Lille toward the end of October. The last-named administration was taken over by newly-formed railway commandos in Liege and Brussels.

"To the south of Military Railway Administration No. 1, Military Railway Administration No. 2 was set up on August 20 in Ulflingen; on August 25 at Libramont and on September 4 at Sedan.

"A newly-formed railway commando followed in Luxembourg. The district covered by these various railway administrations was in time so extensive that a third was pushed forward between them, controlled from Charleroi. In the East, presently, a railway commando was set up in Lodz for the conquered districts of Russian Poland.

"All these authorities are organized by the military administration. The railway traffic is essentially of a military nature and is carried on in the districts close behind the front by railway troops; and, farther in the rear, by ordinary individuals transferred from the German railway administrations.

"The constructional operations of the railway troops consisted during the first months of the war chiefly in restoring damaged railway buildings so as to provide as quickly as possible complete railway communications for the army. New lines were laid where the military authorities needed them most or where our railways had no extensions in the conquered territory. Owing to the unfavorable country and the bad conditions of the roads after such a wet winter, we were obliged to construct a railway system comprising innumerable small 'field railways' so as to bring up ammunition and provisions to the particular place where our troops were located.

"In the place of emergency bridges we had to build later bridges of a permanent character so as to give greater security to the ever-increasing traffic. These operations at the seat of war were carried out by the railway troops and farther back by private German firms.

"During the course of the war up to the present 104 large bridges have been built, 8 tunnels restored and 14 lines opened to traffic. Owing to increased number of lines over 160 stations have been enlarged for the purpose of loading and unloading; also numerous crossover points have been built.

"The following table will give an idea of the development of this military traffic in the enemy country conquered by us with the exception of the Russian lines bordering on East and West Prussia, east of the Vistula:

TRAFFIC IN THE CONQUERED RAILWAY TERRITORIES (BELGIUM AND FRANCE) FOR THE MONTH OF APRIL, 1915
(In round figures)

		Single line	Double line	Total
1.	Distance in Kilometers at the end of the Month:			
A.	Used by military	3,000	4,100	7,100
B.	Leased	450	150	600
C.	Not in use	550	20	570
D.	Not restored	90	29	110
E.	Under construction	400	15	415
	Total	4,490	4,305	8,795
2.	Traffic Management:			
A.	Traffic officials			75
B.	Engineers			25
C.	Workshop officials			10
D.	Stations occupied			1,200
E.	Workshops			70
F.	Gasworks			55
G.	Power stations			350
3.	Benevolent Institutions:			
A.	Isolation hospitals			20
B.	Bath establishments			130
C.	Hospitals			35
D.	Red Cross establishments			30
E.	Dormitories for railway staff			135
F.	Convalescent homes			5

"In considering the above table one must remember that only eight months have elapsed since the railways were taken over under the conditions described previously and the public passenger and freight traffic is still in its infancy. The railways can now, no doubt, respond more efficiently to the demands of public traffic."

WELFARE WORK ON THE PENNSYLVANIA

The Pennsylvania Railroad has issued a pamphlet containing a half-tone reproduction of a photograph of a group of about a hundred of the workmen at its Pittsburgh (Pa.) freight transfer station, all in their hot-weather working clothes; and in connection with the picture the statement is made that the whole force has been kept together, unchanged, for almost two years. The statement explains, further:

"The whole force of laborers numbers 318. Two and one-half years ago the transfer came under the management of George F. Wagner, as agent. Mr. Wagner believed in welfare work. Through his efforts a locker was provided for each man. A large number of wash basins and about 40 shower baths were installed. At the noon hour Victrola music is furnished. Other diversions are provided, and in many ways work at the transfer has been made attractive. The result is that in the last 23 months only one new man has been employed, and he was taken on as an addition to the force because he was a good worker and his services were needed. A working force has been built up at the Pittsburgh transfer that in point of efficiency and the physical and moral character of the individual men would be most difficult to duplicate."

The leaflet which gives this information concerning welfare work at Pittsburgh is itself an instrument in "welfare work"; it contains notes commending a number of employees for fidelity to their duty. Mention is made of another Wagner, track foreman on the Philadelphia division, now 61 years old, who when an unusually heavy rain and electric storm occurred recently in the night, went out, as his custom was, to take a walk over his section; he came across a washout, which very likely would have wrecked a freight train, which soon came along, had he not been there to display his red light.

Another item mentions locomotive engineman O. G. Bloom of the Sunbury division, who, when taking an excursion home one night recently, was delayed by the breakage of some parts of his engine, and who was so skillful and speedy in making temporary repairs, so as to get the excursionists to the end of his run in time to make desired connections, that he aroused great admiration among the passengers; so much so that a committee was appointed and a purse of $76 was raised, and the next day was given to Mr. Bloom. He accepted it with great reluctance.

Another article, accompanied by a portrait, tells how Harry E. Duey, a brakeman on the Tyrone division, on July 13, last, riding on the fireman's seat of the locomotive of his freight train, descending a steep grade, suddenly saw a four-year-old boy sitting on the track, only about 200 ft. ahead of the train. Instantly dashing out of the cab and along the running board, Duey reached the pilot in time to lift the boy clear of the wheels and save his life. Some freight cars on a side track had hidden the boy from the view both of the brakeman and the engineman until they were close to him; and then there was not time to stop. Duey is 27 years old and son of a former employee; active in the Young Men's Christian Association and in athletics.

THE RUSSIAN IRON INDUSTRY.—The production of pig-iron in Russia in the six years ended with 1914 inclusive was:—1914, 5,207,000 tons; 1913, 4,756,000 tons; 1912, 4,111,000 tons; 1911, 3,630,000 tons; 1910, 2,999,000 tons, and 1909, 2,821,000 tons. Half-finished products were turned out during the six years as follows:—1914, 4,594,000 tons; 1913, 5,110,000 tons; 1912, 4,433,000 tons; 1911, 3,885,000 tons; 1910, 3,482,000 tons and 1909, 3,079,000 tons. The output of finished products was: 1914, 4,617,000 tons; 1913, 4,224,000 tons; 1912, 3,676,000 tons; 1911, 3,272,000 tons; 1910, 2,965,000 tons, and 1909, 2,628,000 tons. These figures illustrate the decided progress which Russian metallurgical industry has been making of late years.—*Engineering, London.*

Humidity-Control Process for the Drying of Lumber

Norfolk & Western Dry Kiln at Roanoke, Va., Embodies Features Developed in Recent Government Investigations

By W. H. Lewis
Superintendent Motive Power, Norfolk & Western, Roanoke, Va.

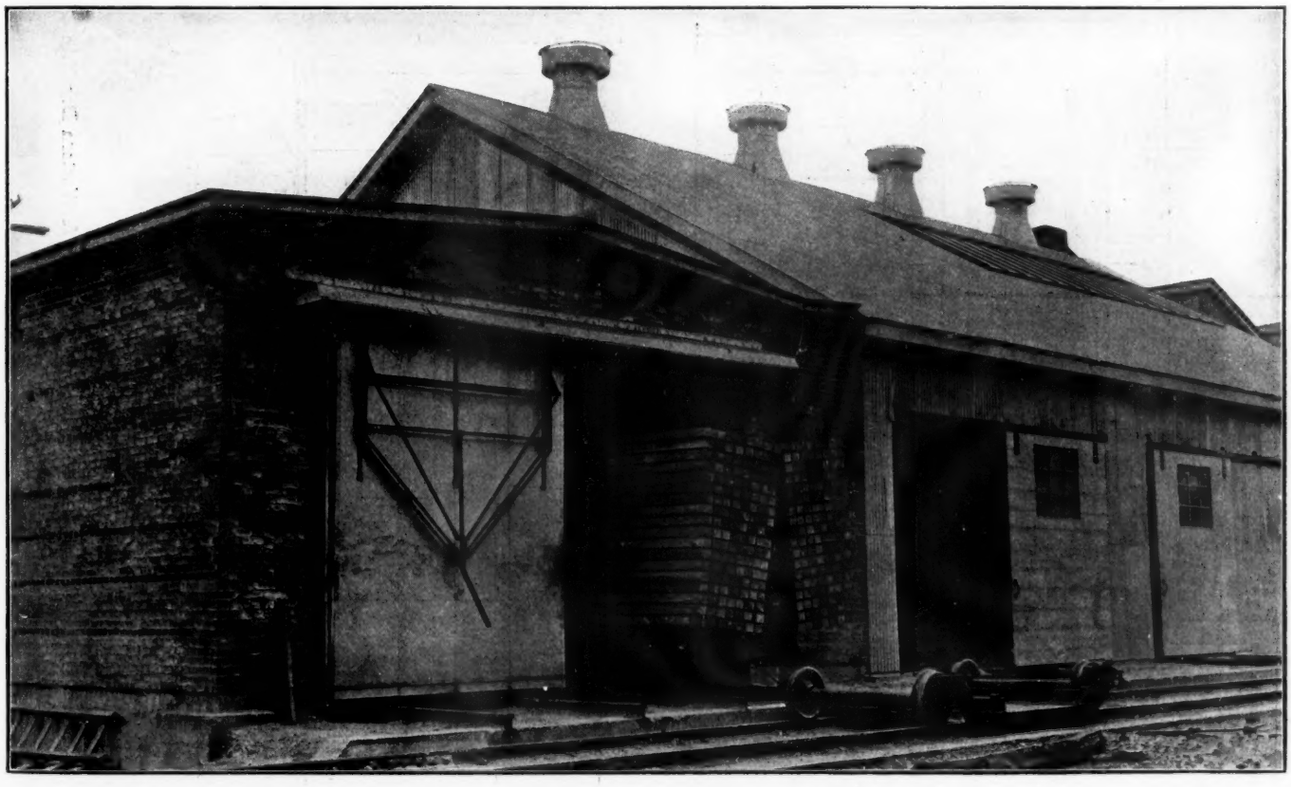
There has been recently put in operation at the Roanoke shops of the Norfolk & Western a dry kiln embodying features worked out in recent government investigations into the principles of the kiln drying of lumber. The kiln represents the direct results of the experiments of the United States forest products laboratory at Madison, Wis., the staff of this laboratory acting with the mechanical department of the Norfolk & Western in designing the kiln and its equipment.

The general principles of drying are based on what is known as the humidity-control system. It was found by the forest products laboratory that the maximum rate at which moisture should be removed from the surface of lumber at any temperature is not greater than that at which it will be drawn through the fibres of the wood to the surface. The only practical way of controlling such evaporative speed is by controlling the humidity of the current of air passsing over and through the lumber; hence the term "humidity-control," as applied to this kiln.

The kiln is unique in that it has no stack and no regular air inlets or outlets. The same heated air is used over and over and the moisture is removed from the air by means of a spray of water which lowers the temperature of the air and causes precipitation of the moisture, the same as natural preciptation of rain in external air; thus the only discharge from the kiln is a small stream of water.

The kiln consists generally of a drying chamber with air legs or spray chambers at either side and with a heating chamber immediately under the drying chamber. The air passes over a bank of steam pipes which are located just under the loads of lumber. The heated air rises and passes through the stacked lumber to the top of the kiln. Along the top of the air legs are spray nozzles which by means of a fine mist of spray chill the air at the top of the kiln, causing it to drop by gravity down the air legs to the bottom of the kiln, where it again comes in contact with the heated steam pipes, thus performing continuous cycles. As the heated air passes through the stacks of lumber the moisture from the lumber is taken up by the air and when this air is chilled at the top of the air legs the excess moisture is precipitated and mingles with the water from the spray nozzles.

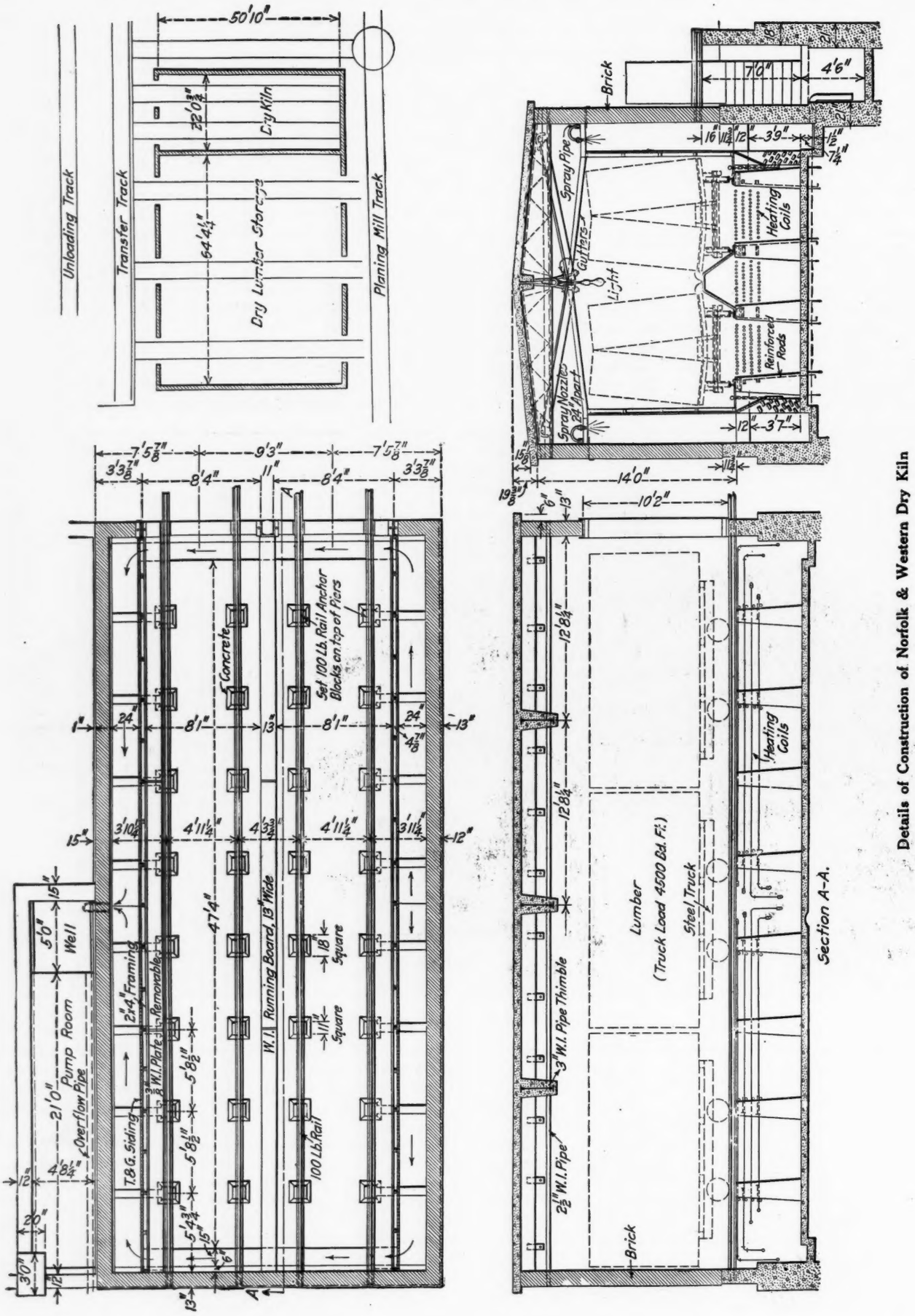
Thermostats are provided for regulating the amount of steam to the steam pipes, by which means the temperature of the drying chamber is controlled, and further means are provided for controlling the temperature of the spray water, by which means the temperature and humidity of the air before it reaches the steam pipes are controlled. The spray water is circulated by means of a suitable pump, so that this water is used over and over, an overflow being provided so that excess water will drain off to the sewer.



Front View of Norfolk & Western Dry Kiln

The kiln is susceptible of very delicate control, and by controlling the humidity of the drying air the speed of drying may be regulated to a nicety. By this means the most rapid consistent rate of drying may be attained without danger of injuring the lumber.

In connection with this kiln there has been provided a dry lumber storage building so that the kiln itself may be of smaller dimensions and kept in continuous use. The kiln is built at one end of the storage building and a transfer car runs on a suitable



Details of Construction of Norfolk & Western Dry Kiln

track along the front of the buildings. The lumber or kiln cars run into either the kiln or the storage building from the transfer car. The location is convenient to the planing mill.

Lengthwise piling of the lumber is used in the kiln, and the kiln cars are of steel and not of the customary knockdown type. A peculiar method of piling the lumber on the car is used, as shown in the illustrations. A tapered central channel is formed for the upward passage of the air, and the strips between the layers of lumber from slightly upward inclined air passages. By this means the current of air passes uniformly through the entire stack of lumber, and uniformity of drying throughout the pile is obtained. The clearance dimensions of the drying chamber of the kiln are as follows: Length, 50 ft. 10 in.; width, 17 ft. 3 in.; height, 10 ft. 2 in.

The kiln holds six kiln cars of lumber, the capacity being

Interior of Humidity Controlled Dry Kiln

approximately 27,000 board feet of 1-in. material. It is supplied with approximately 3,300 sq. ft. of heating surface. The building is of brick laid in cement mortar; the foundations and pipe chamber are of concrete, while the roof is of cinder concrete.

This kiln has been in successful operation drying all kinds of lumber for some time and fully meets the expectations of the designers. A number of patents on the principles involved have been issued to Harry D. Tiemann, of the Forest Products Laboratory, all of which have been dedicated to the public.

REPORT OF COMMISSION ON INDUSTRIAL RELATIONS

The United States Commission on Industrial Relations has given out a report of Basil M. Manly, its director of research and investigation, containing findings of fact and recommendations of the staff with reference to conditions of employment in public utilities, including the Pullman Company and the railroads. It is suggested that the commission recommend the extension of the Newlands act to cover not only all classes of railroad employees, but all employees of public service corporations engaged in interstate commerce, that the functions of the Board of Mediation and Conciliation be extended to provide for the creation of boards of investigation and that the board should be authorized by Congress to create an advisory council composed of equal numbers of employers and employees for the purpose of creating a panel of names from which impartial arbitrators may be chosen.

The report says that "conductors and porters are employed by the Pullman Company under conditions which seem to require radical readjustment and are admitted by officials of the company to be underpaid;" that the salary of the porters is such that they are obliged to secure tips from the public in order to live, and that the Pullman Company is the direct beneficiary of the tips to the extent of the difference between a fair wage and that which is now paid; that the hours of service are extremely long and that the employees of the company are subject to many other abuses, among which are mentioned, "the arbitrary deductions in their salaries for such time as they may not be needed for the actual service of the company, although required to report at the office each morning; the requirement that porters shall furnish blacking, although they are not permitted to charge passengers for the service of shoe cleaning; the system of arbitrary penalties for the infraction of multitudinous rules."

Criticism is made of the company's bonus system, by which employees who have a clean record for the year receive an extra month's salary, on the ground that this penalizes with extra severity any infraction of rules which occurs during the latter half of the year and puts into the hands of officials and inspectors a means of discrimination. It is stated that the effect of the tipping system is not only to degrade those who are obliged to accept tips, but to promote discrimination in the service to the public; that the employees of the company are unable to improve their condition through organization, as employees known to be members of labor unions are discharged; that the company is "tremendously over-capitalized," and that on the basis of cash actually paid in, the annual dividends of the company are not less than 29 per cent.

It is suggested that the commission recommend: the enactment by Congress of a statute prohibiting the tipping of any employee of a public service corporation engaged in interstate commerce, and providing a proper fine for both the giver and the recipient of the tip; the amendment of the existing law regulating the hours of service of train employees to include the employees engaged in the Pullman service; the extension of the Newlands act to cover the Pullman Company.

With reference to railroads, it is suggested that the commission recommend:

Thorough investigation by the public health service of railroad construction camps as well as other labor camps, and the preparation of definite plans for such camps and a standard code of sanitary regulations.

The enactment by Congress of a statute expressly prohibiting corporations engaged in interstate commerce from inducing or compelling their employees to sign releases of liability for accidents.

Congress should enact a statute prohibiting interstate employers from requiring their employees to contribute to benefit funds, and providing for the participation of employees engaged in interstate commerce in the management of all benefit funds and other funds to which they contribute.

The regulation by federal statute of the employment of police on interstate railroads. The statute should not only provide for the organization, personnel and powers of such police, but should definitely provide that during labor disputes such police should be subject to the proper civil authorities and paid out of the public treasury. The statute should also provide that such corporations should be permitted to have firearms only under license, requiring that a definite record be maintained showing the character of each firearm and to whom it is issued.

The assumption by the states of full responsibility and definite provision not only for protecting the property of railroads, but for preventing trespass upon their property.

The report is signed only by Commissioners Frank P. Walsh, John D. Lennon, James O'Connell and A. B. Garretson.

The Qualifications of a Terminal Superintendent

An Analysis of the Essential Elements Necessary to Secure Maximum Results from His Organization

By S. W. Roberts

General Superintendent of Passenger Transportation, Pennsylvania Lines, Pittsburgh, Pa.

To accept as correct the theory expressed by the adage, "That which is worth doing is worth doing well," is an implied, if not an actual acknowledgment that individuals of equal ability and experience performing similar service under identically the same conditions produce dissimilar results; the attainments of each being dependent largely upon the degree of interest in the task at hand. This quality is the inevitable outgrowth of regular systematic education by study, observation, contact with persons possessing superior minds, or through all of these channels. Since a terminal yard organization is composed of individuals, many of whom must perform similar duties and have had similar experience and training, logical reasoning seems to justify the belief that the successful operation of a terminal yard must follow the adoption and application of a plan, the underlying principle of which is represented by continuous active interest on the part of individual members of the organization, because interest is the unmistakable evidence of properly utilized education (mind development) and the latter is indicative of progress.

Mind training of the individual member of a department of whatever nature may of itself be classified correctly as the elementary step of the series of steps essential to the various stages of development in connection with the formation of an organization or working plan. The moulding or crystallization of this available mental energy of any number of members into a compact and powerful mental force capable of effectively resisting opposition to desirable or necessary methods and practices is the result which the head of a department must be able to accomplish. These two factors, namely, continuous active interest on the part of individual members of an organization in their respective positions and duties, and proper utilization of the available energies of all members form the true basis of a terminal yard operation plan.

The executive head of a railway, who is responsible, morally at least, to its stockholders, for the satisfactory management of their affairs, should possess qualifications that will enable him to perfect an organization arrangement efficient not only when applied to one detail, but when subjected to tests involving maximum demands and extreme conditions. The assumption that this reasoning rests on the right principle appears to be ample ground for the conclusion that the head of a terminal yard organization must be as capable an executive in his limited sphere as is the president of a railway whose responsibility extends to the operation of a complete system. Hence the standard of a terminal yard organization, be it good, bad, or average, as indicated by its acts, must thus reflect directly the ability of its head and, perhaps, indirectly the strength or weakness, as the case may be, of the entire organization scheme of which it is a component part.

Having indicated that the true basis of a terminal yard organization plan are, first, a maximum degree of continuous active interest on the part of each unit (member) in his particular service assignment, and the general results; and, second, a proper utilization of the maximum degree of combined energies of all units (members); and having placed the head of a department or organization, irrespective of what his title may be, in the same relation to each of his assistants as is the president of a railway company to each member of his staff, the foundation is thus laid for the question, "What should be the qualifications of a man capable of perfecting an efficient yard organization and obtaining the maximum service from it?" The answer to this question must deal with the standards of many attributes, the more prominent being morality (including temperance), honor, integrity, perseverance, patience, knowledge (including experience), and the innate desire and ability to grow along the right line and influence others to do so.

While a high standard as applied to each of the attributes specified, and each of numerous others of lesser prominence, but of a distinctly kindred nature, has always been recognized as a desirable and valuable asset of a representative of a railroad, particularly one vested with a considerable measure of governing or supervisory authority, too often those qualities which cannot be absent from the life of that type of man whose services are exemplary, and therefore, educational and inspiring to his associates (assistants and others) have been disregarded in the interest of greatly over-estimated ability based upon practical experience only. This statement is not made with the view of depreciating the value of experience to the head of an organization, but to emphasize the fact that since "like produces like" the development of members of a terminal yard organization in accordance with instructions and examples of a head, deficient with respect to qualifications other than knowledge acquired by experience could not possibly conform to the standard of efficiency demanded by conditions of the present age.

The general prevailing tendency in almost all branches and departments of the business world is to employ, as far as practicable, methods which have back of them principles harmonizing with the results of scientific study and research; and that policy, indicating as it does, the growing need of earnest and persistent, but fair competition among individuals, to the end that reforms in the direction of development may be assured regularly, removes completely the basis for arguments favorable to the assumption that a man whose mind is not clear and active and whose moral character is not clean could meet so much as the preliminary requirements of a successful terminal yard organization head.

This conclusion is not expressed either for the purpose of thus conveying the impression that a man with a ripe experience to his credit is incompetent because his moral character is clouded; but in defense of the theory that the highest standard of usefulness and service of any man to his family, his friends, his employer, his community, or his country, must involve the highest standards of development in the attributes heretofore mentioned. Since serious, unprejudiced study, observations and discussions do not disclose many, if any, permanent benefits which accrue from lax morals and all they embrace, but do disclose divers substantial benefits attributable to the reserve condition, we are reasonable in declaring that the dominating influence for good in a terminal yard organization will not emanate from a head with lax morals as a qualification, regardless of the extent of his experience and educational training; the fact that he may possess a pleasing personality, or be able to boast of an enviable physical development, or justly claim credit for recognized social leadership among certain classes in a community.

GENERAL DUTIES

The duties of the head of a terminal yard organization are executive and supervisory in character. The limitations of the former are in general so clearly defined that unauthorized deviations therefrom would be the outgrowth (barring exceptions on account of emergencies) of willful disobedience or ignorance only, the first of which is a true indicator of disloyalty and the second of incompetency.

The supervisory duties of a terminal yard organization head, however, are practically without limitations other than his capac-

ity as measured by the standards heretofore described, and his ability to create among his assistants that degree of personal interest in their respective service assignments, which will insure not alone the transmission of a corresponding degree of interest to their subordinates or fellow members, but the proper utilization of the energy thus developed.

The supervisory duties are both comprehensive and important, involving, as they do, results dependent on services contributed by many employees and bearing a direct relationship to transportation expenses and net earnings. The member of an organization who is interested in his work and who knows the purpose of his existence and appreciates the opportunity to employ his faculties toward the accomplishment of something worth while, combines knowledge with theory and practice and gages his progress by comparative results. The application of the principle supporting that method or system to all members of a department or division thereof suggests immediately as the foundation of supervisory duties, systematic education of employees and accurate measurement of member, branch and department efficiency.

The term "systematic education" implies training regularly in accordance with a stated course, embracing those features of terminal yard operation, which must undergo changes frequently to keep pace with progress, reference being made especially to new or improved methods, improved facilities including equipment and reforms affecting working regulations or the policies of a company.

It is true that different methods of training may be successfully employed by different men, and likewise true that the same methods will not produce the same results when applied to different organizations (qualifications of individual members representing one of the most common factors responsible for variations in training methods and practices); but that a head fully conversant currently with conditions under his jurisdiction may intelligently analyze his forces and their obligations, and prescribe instructions required for their development, is certain.

To be of the greatest possible value to an individual, a branch, a department, or a system as a whole, this training must extend from the unit of service in all cases to the final conclusion, with the relationship of each to each direct and indirect kindred detail clearly established; and the object of efforts and energy expenditures in that direction made manifest through deserved promotions and recognitions otherwise, and statistics disclosing the grades of unit efficiency determined by the employment of accurate measures.

The oft-repeated statement that a certain terminal yard is operated as economically as possible, consistent with the character of demands on it, because the head, a man of long experience is in close contact constantly with the services of each of the members of the organization, no longer has any weight or standing among progressive railroad men, it having been rightfully superseded by the principle that no matter how insignificant may be a position, the services involved by it should be performed under the supervision of some one who is able to judge, using as his guide a reliable measure, whether the services are or are not satisfactory.

Details, knowledge concerning which should be contemplated by a system of education adapted to the needs of terminal yard employees under the direction of the head are numerous, a few of the more prominent being:

The direct and indirect functions of a terminal yard; the relation of the yard to other parts of a railway system, and the relation of its organization to other departments and the public.

The value of loyalty and efficiency to the individual employee and an organization, and their probable rewards.

The meaning of the word "discipline"; the necessity for discipline, and the method of administration which is most effective.

The value of harmony among members of an organization.

Effect of dissensions and discord among members of an organization on operations.

The purpose and value of accurate reports relative to service; extraordinary conditions affecting operations; prospective traffic movements (passenger and freight); personal injury and other accidents; classified cars on hand, cars damaged and cars repaired or relieved of lading by transfer; prospective new or enlarged industries and any other matters bearing upon some feature of terminal yard operation with which a head should be familiar.

Courteous treatment of passengers, shippers and receivers of freight and other patrons of the company contrasted with the reverse policy.

The connection of originality of the individual employee with success.

Punctuality, system and self-control; their value to the individual employee and an organization.

Team work contrasted with the reverse organization arrangement.

Patience and sympathy; when necessary, and why.

Economy contrasted with extravagance or near-extravagance.

Service measures; the necessity therefor and their value to the individual, branch (or sub-department), and an organization.

Harsh, rough language, and its effect on loyalty and efficiency.

Train and personal injury accidents; the common causes therefor and precautions necessary to prevent them.

The light loading of cars and the light rating of locomotives; the adverse effect of such practices on yard and train operations.

Rough handling of cars in yards, and the results as applied to freight claims and car maintenance expenses.

Detentions to foreign cars within yard limits; the common causes therefor and the character of reports and records, and individual employee interests, necessary to reduce detentions to the minimum.

The result of improper or late assignment of work to branch (or sub-department) heads of an organization, reduced to an efficiency loss representing abnormal operating expenses.

While each of these details, as well as each of various others, has a definite place to fill in the educational program of the head of a terminal yard organization, they are of unequal utility, of which fact through study and practice an individual employee will learn in the same manner as his knowledge concerning the function of each of the parts of his body, their service value to him, and the relationship to life, is acquired.

Summarizing briefly the substance of the foregoing, the head of a terminal yard organization must himself be a real man, which type cultivates interest and harmony, inspires confidence, encourages ambition, influences loyalty and capability, and condemns vice in every form, by acts founded upon honor, equity, fairness and frankness; the enforcement of intelligent and reasonable instructions, and the exhibition of results of precise unit service measurements.

RAILWAY CONSTRUCTION IN CHINA.—A recent British consular report says that the Chekiang Railway has been formally taken over by the Chinese Government and placed under the control of the Shanghai-Nanking Railway management. It is now known as the Shanghai-Hangchow-Ningpo Railway. Apart from a heavy deficit in the funds handed over it is found that, as a result of Chinese construction and management, the whole of the rolling stock will have to be replaced and the road bed relaid. The problem of bridging the Chientang river is still unsolved. The possibility of crossing near Fuyang has been debated, but the shifting bottom of the river presents a well-nigh insuperable obstacle. Material held up at Tsingtau during the siege has now been delivered, and progress is being made with the construction of the bridge near Paikuan. The line beyond Hangchow will, it is surmised, eventually run via Chiakou and Fuyang to Chuchi, Shaohsing and Paikuan. Another branch will probably run from Fyang to Lanchi, the junction from Chinhua and Wenchow in one direction, and Ch'uchow, Changshan, Yushan, and the Ning Hsiang Railway (Nanking Hunan) in the other.

General News Department

Members of the Order of Railway Telegraphers employed on the Chicago Great Western, who have been negotiating with the management for increases in pay, have broken off negotiations and are said to be preparing for a strike.

The Department of Labor and Industry of Pennsylvania holds that women may not be employed as telegraphers or telephone operators more than six days in a week. The request for a ruling came from women employed in railroad work.

The Pennsylvania Railroad has notified the heads of departments that employees who wish to attend military training camps may be allowed two weeks' vacation for that purpose, in addition to the ordinary vacation, but the company will not pay any salaries or wages during this military vacation.

The Stockton division, the Shasta division and the Sacramento shops have been awarded the 1915 safety banners awarded annually by the Southern Pacific Company for the greatest progress shown during the fiscal year in the furtherance of "safety-first" work on the company's Pacific system.

The Pacific & Eastern, a 33-mile railroad running from Medford, Ore., to Butte Falls, Ore., has established passenger service between Medford and Eagle Point, a distance of 12 miles, with a gasoline motor car, formerly used for inspection service, on which has been mounted an omnibus body that will accommodate 8 or 10 persons.

The Agricultural Department at Washington reports that during the month of July railroads and shippers were fined $18,000 for violations of the 28-hour law concerning transportation of animals, and the quarantine law. Fines aggregating $5,100 were imposed on the Rock Island in 51 cases of violations of the 28-hour law; and similar fines, aggregating $1,800, against the Chicago, Burlington & Quincy.

Pending the reconstruction of the damaged approaches of the Galveston causeway ocean-going traffic is moving through the port of Texas City. The steamships of the Mallory line will take on and land cargoes there and it is expected that cotton shipments will suffer comparatively little curtailment. All the Galveston railroads are running trains into Texas City. It is thought that it will probably be September 20 before trains can run into Galveston.

It is announced in Buffalo that arrangements for the sale of the Buffalo & Susquehanna Railway to the Western New York & Pennsylvania Traction Company have been finally completed, and that the auction sale of the property, which was to have been held on September 13, will not take place. The new owners are expected to run passenger trains with gasolene motor cars, while using steam locomotives for freight.

The board of arbitration appointed under the Newlands act which arbitrated the controversy between the western railways and their engineers and firemen, has recently been in session in Chicago, and on August 30 rendered a supplemental award deciding a large number of disputed points regarding interpretations of the original award, which had been submitted to the board by both sides.

The building of the "Salt Lake Route-Union Pacific" route at the Panama-California Exposition at San Diego has been awarded a gold medal for its unique features. This building was put up to provide information to world travelers and comfort to exposition visitors. It contains a rest room for ladies and children, with a maid in attendance, information bureau and telephone booths, smoking room for gentlemen and other accommodations. The special rest room provided for the entertainment of visiting railroad men is one of the prominent features.

The Massachusetts Terminal Commission, appointed by the governor of Massachusetts and the mayor of Boston, under authority of the Massachusetts legislature (*Railway Age Gazette*, July 9, page 71), is making an exhaustive study of railroad terminals in some of the leading cities throughout the United States for the purpose of being able to recommend improvements in the terminal facilities in Massachusetts and around Boston. After visiting some of the principal Eastern cities, the commission spent two days, August 23 and 24, inspecting the St. Louis terminals, belt lines, etc., and on the following day visited the terminals at Kansas City, planning to visit New Orleans on the return trip.

Robert J. Bailey of Pittsburgh, Pa., secretary of the Individual Car Owners' Association, has issued a circular announcing that renewed efforts are to be made to secure for the 150,000 freight cars in the country not owned by the railroads better rates for use of cars, better means of preventing misuse, lower prices for repairs made on these cars by the railroads and better regulation of demurrage; and he invites all owners of such cars to join the association and to come to the annual meeting, to be held in Pittsburgh next Tuesday. There will also be considered at that time a proposal to form a corporation with $200,000,000 capital, to acquire, hold and operate private cars of all classes, and to own shops and build and repair cars.

The Streets Company

The Streets Company, of Chicago, having purchased and taken over the cars and business formerly owned by the Street's Western Stable-Car Line, announces its officers as follows: F. J. Reichmann, president; M. L. Marston, vice-president and treasurer, to succeed H. Kiper, who held that position in the old corporation; Robert J. Mills, assistant to the president, and F. H. Sweringen, master car builder.

Valuation Order No. 20

The Interstate Commerce Commission has issued valuation order No. 20 regarding information concerning the corporate history of the carriers as follows:

It is ordered that every common carrier owning or operating a steam railroad whose property is to be valued by the commission under the valuation act of March 1, 1913, and every receiver or operating trustee of any such carrier, shall prepare and file in the office of the commission at Washington, D. C., on or before six months after the service of this order upon it, a statement showing the following facts as to each corporation, company or firm, at any time connected with said railroad.

1. Give name of corporation, company or firm; date of incorporation and date of organization. If a corporation, state whether incorporated under the general law or by special act. If incorporated under the general law, state where the articles of incorporation were filed. If incorporated by special act, give reference to the act.

2. Describe the railroad, or portion of the railroad, constructed by each corporation, company or firm and show as to each such railroad, or portion of railroad, as so constructed, the termini, the mileage of main line, the mileage of any branch or branches and the date of construction.

3. State the length of time any such railroad or portion of railroad was actually operated by any such corporation, company or firm, giving, in each instance the date of beginning and date of conclusion of such operation.

4. If any such corporation has gone out of existence, describe the proceedings by virtue of which the dissolution took place. If any such corporation is still in existence, state where its records are kept and give the name and address of the person who has custody of them.

5. State fully the chain of title by which the present corporation has acquired the property which it now owns or operates. In this connection, prepare and file with the commission, as aforesaid, a schedule of all deeds, leases, reorganization proceedings and other instruments bearing upon the corporate his-

tory and assemble and arrange the same for inspection and examination by representatives of the commission.

The carrier shall file with the commission copies of the above documents and records or extracts from the same as may be designated by the director of valuation within 30 days after notice.

6. Prepare and file with the commission a diagrammatic chart similar to and containing information like that given on the sample chart hereto attached.

Operating Revenues and Expenses of Express Companies for April, 1915

The following statement, which is subject to revision, has been compiled by the Interstate Commerce Commission from the monthly reports of operating revenues and expenses of the principal express companies for April, 1915. (The express companies have three months in which to make reports):

A—FOR THE MONTH OF APRIL.

Item	Adams Express Co.		American Express Co.		Canadian Express Co.		Globe Express Co.		Great Northern Express Co.	
	1915	1914	1915	1914	1915	1914	1915	1914	1915	1914
Mileage of all lines covered (miles)	44,878.65	38,615.94	72,616.10	60,848.13	9,676.50	7,080.31	2,839.78	2,839.78	9,551.73	9,334.20
Charges for transportation	$2,980,181	$2,662,858	$4,093,738	$3,473,040	$262,250	$250,417	$54,749	$46,519	$242,408	$232,739
Express privileges—Dr.	1,378,349	1,391,869	2,045 960	1,757,461	123,579	113,178	27,289	23,844	147,072	141,549
Operations other than transportation	44,773	31,714	217,945	176,656	5,559	11,484	865	809	4,343	4,155
Total operating revenues	1,646,605	1,302,703	2,265,773	1,892,235	144,230	148,722	28,325	23,484	99,679	95,344
Operating expenses	1,448,925	1,352.335	1,966.906	1,862 847	121,914	129,504	27,702	28,286	87,093	89,827
Net operating revenue	197,679	49,631	298,867	29,387	22,315	19,218	622	4,802	12,585	5,517
Uncollectible revenue from transp'n	419	.....	449	49	11	.....	.....	.....	33	.....
Express taxes	16,300	18 260	31,646	35,454	4.000	3,000	1,600	800	3,122	3,440
Operating income	180,959	67,891	266,772	5,115	18,304	16,216	977	5,602	9,429	2,075

Item	Northern Express Co.		Southern Express Co.		Well Fargo & Co.		Western Express Co.		Total for All Companies Named*	
	1915	1914	1915	1914	1915	1914	1915	1914	1915	1914
Mileage of all lines covered (miles)	8,118.34	8.080.40	34.574.60	33,526.60	112,995.30	100,001.21	5,174.26	5,008.97	300,425.26	297,181.39
Charges for transportation	$211,157	$213,050	$1,241,326	$1,339,682	$3,341,186	$2,535,383	$97,443	$89,826	$12,524,493	$12,310,956
Express privileges—Dr	116,097	116,959	657,257	692,956	9,709,748	1,273,784	46,410	50.520	6,251.766	6,326.857
Operations other than transp	3,613	3.276	26 009	24,710	65,820	57,660	3,203	2,463	372,135	340,496
Total operating revenues	98,673	99,367	610,077	675,436	1,697,258	1,319.260	54 236	41,770	6,644.862	6.324,595
Operating expenses	87,318	84,591	513,353	565,487	1,458,866	1,193,446	48,678	46,914	5,760,761	6,161,272
Net operating revenue	11,355	14,775	96,724	109,948	238,392	125,813	5,558	5,144	884.101	163,323
Uncollectible revenue from transp'n	18	2	84	1	1,063	.....	13	.....	2,094	52
Express taxes	5,000	4,500	14,132	15,266	31,561	35,000	905	1,095	108,270	127,523
Operating income	6,336	10,273	82,506	94,680	205,767	90,813	4,638	6,240	773,737	35,738

B—FOR THE TEN MONTHS ENDING WITH APRIL.

Item	Adams Express Co.		American Express Co.		Canadian Express Co.		Globe Express Co.		Great Northern Express Co.	
	1915	1914	1915	1914	1915	1914	1915	1914	1915	1914
Charges for transportation	$28,351,210	$27.874,524	$38,198,826	$34.591.037	$3,571,009	$2,638,179	$593,099	$557,354	$2,575,967	$2,686,241
Express privileges—Dr.	14,207,366	14,639,216	19,178,252	17,358,875	1,290,313	1,253,387	297,358	281,171	1,571,493	1,643,282
Operations other than transportation	412.837	302,814	1,844,674	1,811.578	49,994	92.061	8,053	8,263	42.989	41.653
Total operating revenues	14,556,680	13,538,122	20,865,248	19,043,739	1,330,690	1,476,852	303,794	284,446	1,047,463	1,083.611
Operating expenses	15,095,392	14,004,380	20,500,459	19,343,422	1,283,755	1,399,509	290,748	300.239	886,344	898,861
Net operating revenue	538,711	466,258	364,738	299,683	46,935	77,343	13,046	15,793	161,119	184,749
Uncollectible revenue from transp	4.870	.....	2,201	207	88	.....	.....	.....	88	.....
Express taxes	168,789	169,399	329,061	313,282	40,000	28,700	10,600	10,800	38,002	38,402
Operating income	712,372	635,657	32,525	613,173	6,846	48,643	2,446	26,593	123,027	146,347

Item	Northern Express Co.		Southern Express Co.		Wells Fargo & Co.		Western Express Co.		Total for All Companies Named	
	1915	1914	1915	1914	1915	1914	1915	1914	1915	1914
Charges for transportation	$2,261,871	$2,476,051	$11,691,037	$13,134,357	$31,490,638	$26,130,420	$953,923	$992,760	$118,687,585	$127,461,753
Express privileges—Dr	1,326,108	1,346,625	6,037.075	6,746,926	16,113,814	13,081,794	497,215	552,467	60,428,997	64,993,201
Operations other than transp	32.875	32,256	252,854	278,072	592,273	548,040	30,811	23,680	3,267,363	3.394.741
Total op rating revenues	1,058,638	1,161,682	5,906,816	6.665 503	15,969,097	13,596,667	487.520	463.973	61,525,951	65,358,293
Operating expenses	884,940	906,664	5,251,464	5,779,514	14,803,204	12,336,913	517,837	495,368	59,524.148	64,145.943
Net operating revenue	173,697	255,017	645,352	885,988	1,165,893	1,259,753	30,317	31,394	2,001,903	1,712,351
Uncollectible revenue from transp.	150	38	528	127	8,998	.....	91	.....	17,018	373
Express taxes	50,000	45.000	145.888	150.901	351,015	333,000	9,986	8,570	1,143,344	1,207.776
Operating income	123,547	209,979	498,935	734,959	805,879	926,753	40,395	39,965	841,441	504,202

*Includes previous year's returns of United States Express Co.

Traveling Engineers' Association

The twenty-third annual convention of the Traveling Engineers' Association will be held at the Hotel Sherman, Chicago, commencing at 10 a. m., Tuesday, September 7, and continuing four days. The subjects to be discussed are as follows: "What Effect Does the Mechanical Placing of Fuel in Fireboxes and Lubricating of Locomotives Have on the Cost of Operation?" W. L. Robinson, chairman; "Recommended Practices for the Employment and Training of New Men for Firemen," L. R. Pyle, chairman; "The Advantages of the Use of Superheaters, Brick Arches and Other Modern Appliances on Large Engines, Especially Those of the Mallet Type," J. E. Ingling, chairman; "How Can the Road Foreman of Engines Improve the Handling of the Air Brakes on Our Modern Trains?" C. M. Kidd, chairman; "Difficulties Accompanying Prevention of Dense Black Smoke and its Relation to Cost of Fuel and Locomotive Repairs," Martin Whelan, chairman; "The Electro-Pneumatic Brake," W. V. Turner; "The Effect of Properly Designed Valve Gear on Locomotive Fuel Economy and Operating," W. E. Preston; "Scientific Train Loading, Tonnage Rating, the Best Method to Obtain Maximum Tonnage Haul for the Engine Over the Entire Division, Taking Into Consideration the Grades at Different Points on the Division," O. S. Beyer, Jr.

In accordance with the usual custom there will be a goodly number of instructive exhibits furnished by the supply companies. On Wednesday the entire evening will be devoted to inspection of the exhibits. Thus far 43 companies have reserved space. They are as follows:

American Arch Company; American Locomotive Company; American Steel Foundries; Ashton Valve Company; Barco Brass & Joint Company; Chambers Valve Company; Chicago Car Heating Company; Commercial Acetylene Company; Crane Company; Dearborn Chemical Company; Dela-

ware Railway Specialty Company; Detroit Lubricator Company; Equipment Improvement Company; Galena Signal Oil Company; Garlock Packing Company; Greene, Tweed & Co.; Hunt Spiller Mfg. Corp.; Jerome-Edwards Metallic Packing Company; Kelley Wood Safety Locomotive Side Curtain Company; Liberty Manufacturing Company; Locomotive Stoker Company; Locomotive Superheater Company; Manning, Maxwell & Moore, Inc.; Mudge & Co.; Nathan Manufacturing Company; National Boiler Washing Company; National Graphite Lubricator Company; National Railway Devices Company; Ohio Injector Company; O'Malley Beare Valve Company; Paxton Mitchell Company; Pilliod Company; Pocket List of Railroad Officials; Pyle-National Electric Headlight Company; *Railway Age Gazette;* Robinson Company; William Sellers & Co., Inc.; Southern Locomotive Valve Gear Company; Standard Heat and Ventilation Company, Inc.; United States Graphite Company; Harry Vissering Company; White American Locomotive Sander Company, Inc

Railway Signal Association

The twentieth annual convention of the Railway Signal Association will be held at Hotel Utah, Salt Lake City, Utah, September 14, 15 and 16. The program is made up of the committee reports noted below:

Tuesday

Committee I: Signaling Practice.—The use of switch indicators or signals to serve the same purposes; economics of signal maintenance; capacity of single track.

Committee VII: Relays.—Report on resistance and other data obtained on various types of relays.

Report of Committee III: Power Interlocking.—Revised specification for electro-pneumatic interlocking, including ten typical circuit drawings (were discussed at May meeting); revised specifications for fiber conduit; specifications for incandescent electric lamps.

Committee VI: Standard Designs.—Twenty-six drawings showing details and assembly of signal apparatus.

Wednesday

Committee II: Specifications for electro-mechanical interlocking.

Committee V: Manual Block.—Instructions for testing and maintaining dry cells; instructions for maintaining gravity cells; instructions for maintaining caustic soda cells.

Special Committee on Lightning Protection.—Requisites for lightning arresters for signaling; requisites for choke coils for signaling; specifications for vacuum gap lightning arresters.

Wednesday afternoon: Trip to Saltair.

Thursday

Committee VIII: Electric Railways and Alternating Current Signaling.—Specifications for reactors for line and track circuits; historical data on alternating current signaling.

Committee X: Storage Battery.—Specifications for nickel-iron-alkaline storage battery.

Special Committee on Electrical Testing.—Progress report on recording apparatus.

Thursday afternoon: Ball game.

The annual dinner will be on Wednesday evening.

International Engineering Congress

The International Engineering Congress, organized and conducted under the auspices of the American Society of Civil Engineers, the American Society of Mechanical Engineers, the American Institute of Mining Engineers, the American Institute of Electrical Engineers, and the Society of Naval Architects and Marine Engineers, will convene at San Francisco on September 20 for a six days' meeting. All sessions will be held in the Auditorium Building, Hayes and Larkin streets.

At the opening session on Monday morning, September 20, General Goethals and others will address the convention. Monday afternoon will be devoted to discussions relating to the Panama Canal. Among the papers presented will be one on the Commercial and Trade Aspects of the Panama Canal, by Dr. Emory R. Johnson, professor of transportation and commerce, University of Pennsylvania. On the following four days separate sessions will be held to discuss Waterways, Irrigation, Railway Engineering, Municipal Engineering, Materials of Engineering Construction, Mechanical Engineering, Electrical Engineering, Mining Engineering, Metallurgy and Naval Architecture and Marine Engineering.

The program of the Railway Engineering Congress is as follows:

RAILWAY ENGINEERING

Tuesday, 10 a. m.

Railways.—William Barclay Parsons, consulting engineer, New York.

The Status of the Railways of North and South America.—F. Lavis, consulting engineer, New York.

Italian Railways.—Luigi Luiggi, president of the Italian Society of Civil Engineers and former member of the Italian State Railway Board, Rome, Italy.

The Status of Indian Railways.—Victor Bayley, assistant secretary Railway Board, India, Simla, India.

The Status of Chinese Railways.—Charles Davis Jameson, supervising engineer and architect to the Imperial Chinese Board of Foreign Affairs, Peking, China.

The Status of Russian Railways.—V. A. Nagrodsky, Petrograd, Russia.

The Status of Railways and Tramways in the Netherland East-Indies.—E. P. Wellenstein, Netherlands Indian Government Railways' Engineer, The Hague.

Afternoon

Economic Considerations Controlling and Governing the Building of New Lines.—John F. Stevens, New York.

The Locating of a New Line.—William Hood, chief engineer, Southern Pacific, San Francisco.

The Locating of a New Line.—David Wilson, Johannesburg, South Africa.

Tunnels.—Charles S. Churchill, assistant to president, Norfolk & Western, Roanoke, Va.

Tunnels in Italy.—Luigi Luiggi.

Tunnels in Switzerland.—R. Winkler, Direktor der technischen Abteilung der Schweizer Eisenbahndepartements, Berne, Switzerland.

Thursday, 10 a. m.

The Reconstruction of the Panama Railroad.—Frederick Mears, Lieut. U. S. A., formerly chief engineer, Panama Railroad; member Alaska Engineering Commission, Washington.

Railway Construction Methods and Equipment in Australia.—Maurice E. Kernot, chief engineer for Railway Construction, Victoria, Australia.

Track and Roadbed.—George H. Pegram, chief engineer, Interborough Rapid Transit Company, New York.

American Railroad Bridges.—J. E. Greiner, consulting engineer, Baltimore, Md.

Afternoon

Recent Locomotive Development.—George R. Henderson, consulting engineer, Baldwin Locomotive Works, Philadelphia.

Rolling Stock (other than Motive Power).—A. Stucki, president Engineers' Society of Western Pennsylvania, Pittsburgh, Pennsylvania.

The Floating Equipment of a Railroad.—F. L. DuBosque, New York, N. Y.

Railroad Terminals.—B. F. Cresson, Jr., New Jersey Harbor Commissioners, Jersey City, N. J.

Friday, 10 a. m.

Electric Motive Power in the Operation of Railroads.—William Hood, San Francisco.

Electric Motive Power in the Operation of Railroads.—E. H. McHenry, consulting engineer, New Haven, Conn.

Signals and Interlocking.—Charles Hansel, New York.

Among papers to be presented on other subjects will be those on the Preservative Treatment of Timber, by Howard F. Weiss and Clyde H. Teesdale, Forest Products Laboratory, Madison, Wis.; Aggregates for Concrete, by E. S. Thompson, Newton Highlands, Mass.; Alloy Steels in Bridge Work, by J. A. L. Waddell, consulting engineer, Kansas City, Mo.; Testing Full-Size Members, by Gaetano L. Lanza, Philadelphia, Pa., and Equipment, Processes and Methods for Boiler Shops, by E. C. Meier, Phoenixville, Pa.

Central Railway Club

The next meeting of the Central Railway Club will be held at the grounds of the Automobile Club of Buffalo on Friday, September 10, and will consist principally of the annual outing of the club. Members will assemble at Statler's hotel at 10 a. m. J. W. Gibney and H. C. Edson are a special committee on sports. There will be a dinner at the club house. The only business on the program is the reading of a short paper, on "Rivers and Canals," by William Elmer, superintendent of motive power of the Pennsylvania Railroad at Buffalo.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, date of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass. Next convention, May 2-5, 1016, Atlanta, Ga.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago.

AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—H. C. Boardman, D. L. & W., Hoboken, N. J. Next meeting, October 21-23, 1915, Boston, Mass.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, Illinois Central, East St. Louis, Ill.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, Room 101, Union Station, St. Louis, Mo.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burritt, 8 W. 40th St. New York. Annual convention, October 4-8, 1915, San Francisco, Cal.

AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOCIATION.—H. G. McConnaughy, 165 Broadway, New York. Meetings with American Electric Railway Association.

AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPEFITTERS' ASSOCIATION.—W. E. Jones, C. & N. W., 3814 Fulton St., Chicago.

AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 75 Church St., New York. Next meeting, November 17, 1915, Chicago.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 19-21, 1915, Detroit, Mich.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 21-23, 1916, Chicago.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Building, Chicago. Annual meeting, June, 1916.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—Owen D. Kinsey, Illinois Central, Chicago.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Annual meeting, December 7-10, 1915, New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 18-20, 1916, Chicago.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, Rooms 1116-8, Woodward Bldg., Washington, D. C. Annual meeting, June 28, 1916, Detroit, Mich.

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Annual meeting, 2d Tuesday in October, 1915, New York.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—C. W. Egan, B. & O., Baltimore, Md. Next meeting, May 19, 1916, Atlantic City, N. J.

ASSOCIATION OF RAILWAY ELECTRIC ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago. Annual meeting, October, 1915.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, Soo Line, 112 West Adams St., Chicago. Annual meeting, June 20-22, 1916, St. Paul, Minn.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York. Next meeting, December 14-15, 1915, St. Louis, Mo.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—L. D. Mitchell, Detroit Graphite Co., Chicago, Ill. Meetings with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual meeting, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Traffic Manager, R. E. & P., Richmond, Va. Annual session, May 17, 1916, Washington, D. C.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—C. G. Hall, C. & E. I., 922 McCormick Bldg., Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1126 W. Broadway, Winona, Minn.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, C. H. & D., Lima, Ohio.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—T. I. Goodwin, C. R. I. & P., Eldon, Mo. Next meeting, October 19-21, 1915, St. Louis, Mo.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Next convention, September 14-16, 1915, Detroit, Mich.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Building, Chicago. Annual meeting, June, 1916.

NATIONAL RAILWAY APPLIANCE ASSOCIATION.—C. W. Kelly, 349 People's Gas Bldg., Chicago. Next convention, March, 1916, Chicago.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meetings, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILROAD MEN'S IMPROVEMENT SOCIETY.—J. B. Curran, Erie R. R., 50 Church St., New York. Meetings, alternate Thursdays, October to May. Assembly Rooms of Trunk Line Association, 143 Liberty St., New York.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York. Annual meeting, December, 1915. Waldorf-Astoria Hotel, New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, 1063 Monadnock Block, Chicago. Meetings with Association of Railway Electrical Engineers.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, Fire Ins. Agt., Mobile & Ohio, Mobile, Ala. Next meeting, October 5-7, 1915, Chicago.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Annual meeting, September 14-17, 1915, Salt Lake City, Utah.

RAILWAY STOREKEEPER'S ASSOCIATION.—J. P. Murphy, N. Y. C. R. R., Box C., Collingwood, Ohio.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 2136 Oliver Bldg., Pittsburgh, Pa. Meetings with Master Car Builders' and Master Mechanics' Associations.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 50 Church St., New York. Meetings with Association of Railway Telegraph Superintendents.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—L. C. Ryan, C. & N. W., Sterling, Ill. Annual meeting, September 7-10, 1915, Chicago.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

SALT LAKE TRANSPORTATION CLUB.—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—Carl Nyquist, C. R. I. & P., 1134 La Salle St. Sta., Chicago. Annual meeting, October 19-21, Colorado Springs, Colo.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga. Annual meeting, January, 1916.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEWARK.—John J. Kautzmann, P. O. Box 238, Newark, N. J. Regular meetings, 1st Monday in month, except July and August, The Washington, 559 Broad St., Newark.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Hotel Astor, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Agt., Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings bi-monthly, Pittsburgh.

TRAFFIC CLUB OF ST. LOUIS.—A. F. Versen, Mercantile Library Bldg., St. Louis, Mo. Annual meeting in November. Noonday meetings October to May.

TRAIN DESPATCHER'S ASSOCIATION OF AMERICA.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next convention, June 21, 1916, Toronto, Ont.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. R. R., East Buffalo, N. Y. Annual meeting, September 7-19, 1915, Chicago.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Building, Chicago. Regular meetings, 3d Tuesday in month, except June, July and August, Karpen Bldg., Chicago.

WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY, 1915.

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses						Net operating revenue (or deficit).	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
		Freight.	Passenger.	Total, inc. misc.	Maintenance—Way and structures.	Maintenance—Of equipment.	Traffic.	Trans. portation.	Miscellaneous.	General.	Total.				
Alabama Great Southern	309	$275,185	$100,248	$402,147	$36,643	$92,770	$12,934	$124,238	$3,432	$8,399	$278,416	$123,731	$15,153	$108,578	$23,163
Arziona Eastern	378	204,051	36,886	254,681	32,004	25,019	2,500	51,328	920	11,334	123,213	131,468	14,220	117,175	21,936
Baltimore & Ohio Chicago Terminal	79	.....	635	128,206	18,793	19,345	905	52,241	2,242	5,697	94,553	33,653	17,654	15,986	—5,032
Bessemer & Lake Erie	205	1,214,711	36,831	1,265,807	72,376	165,668	9,306	233,832	.....	12,529	485,652	780,154	16,783	763,362	182,836
Bingham & Garfield	27	170,181	2,977	173,543	19,523	20,577	977	21,395	207	1,789	64,668	108,875	3,902	104,974	15,056
Buffalo & Susquehanna Railroad Corp.	253	106,485	7,189	116,065	22,232	33,001	1,047	32,634	.....	5,784	94,699	21,367	2,600	18,767	11,689
Buffalo, Rochester & Pittsburgh	586	819,946	105,041	961,397	184,267	198,571	11,261	267,894	1,063	21,281	684,337	277,060	20,000	257,060	27,584
Chicago & Northwestern	8,108	4,239,960	2,022,776	7,059,156	1,259,550	1,212,579	119,102	2,397,048	58,557	152,403	5,186,016	1,873,141	385,000	1,486,823	—375,967
Chicago Junction	12	.....	.....	168,499	23,833	17,449	1,031	86,552	.....	7,430	136,295	32,204	1,695	30,501	251,527
Chicago, Peoria & St. Louis	255	91,909	27,549	127,414	29,644	28,664	5,706	51,412	.....	5,671	121,096	6,318	4,098	2,220	—16,350
Chicago, St. Paul, Minn. & Omaha	1,753	278,687	486,961	1,390,734	237,101	181,889	29,638	486,953	18,489	37,741	989,647	401,086	77,954	323,016	—104,213
Cincinnati, New Orleans & Texas Pacific	337	585,260	135,847	766,776	86,902	151,989	22,375	235,855	4,556	18,017	519,693	247,083	31,000	216,083	26,061
Colorado Midland	338	86,418	27,169	121,917	32,065	31,061	8,127	52,125	1,944	5,316	130,638	—8,720	10,000	—18,720	12,993
Cumberland Valley	164	179,010	53,046	244,587	33,921	33,558	4,690	76,981	787	7,599	157,536	87,051	5,794	81,257	17,702
Delaware, Lackawanna & Western	959	2,186,542	814,565	3,387,072	497,956	537,162	74,782	1,081,975	33,620	74,438	2,292,887	1,094,185	186,600	907,556	—211,624
Detroit & Mackinac	400	54,602	31,276	93,344	9,851	16,308	2,009	32,132	335	2,614	63,248	30,097	7,551	22,545	—1,747
Duluth & Iron Range	273	818,505	18,442	862,399	65,784	80,516	1,306	154,084	996	8,853	311,538	550,861	44,781	506,080	80,892
Duluth, South Shore & Atlantic	626	186,832	91,635	308,484	63,713	33,371	7,332	96,827	3,879	8,482	213,605	94,879	17,000	77,866	35,411
El Paso & Southwestern Co.	1,027	576,134	125,347	748,842	121,976	121,917	18,659	191,804	5,875	26,986	463,009	285,833	34,889	250,944	—4,360
Cripple Creek & Colorado Springs	87	98,867	42,381	143,132	21,196	13,837	6,393	31,956	.....	3,997	77,378	65,154	7,005	58,749	.....
Illinois Central	4,767	3,346,774	1,144,361	4,878,826	884,672	1,263,856	105,814	1,659,103	29,589	147,973	4,076,886	801,940	269,700	531,297	—175,044
Indiana Harbor Belt	110	.....	.....	251,531	37,731	22,982	3,347	98,128	.....	7,582	169,770	81,761	7,547	74,146	12,070
International & Great Northern	1,160	457,958	146,910	659,699	115,053	141,171	20,581	302,461	4,566	28,200	606,541	53,158	30,000	23,096	101,703
Kanawha & Michigan	177	239,884	30,795	277,545	37,641	54,925	3,467	71,137	.....	7,836	175,007	102,539	11,750	90,789	1,379
Kansas City Southern	837	626,580	127,507	831,355	81,421	75,505	24,664	267,491	34,810	34,810	466,012	365,344	44,581	320,578	—10,450
Lehigh & Hudson River	97	137,192	10,324	154,095	24,503	19,874	1,418	49,748	.....	4,224	99,767	54,328	4,200	50,128	11,483
Lehigh & New England	296	304,694	1,186	320,002	42,233	33,708	1,951	63,564	.....	4,857	146,113	173,888	6,200	167,688	67,136
Louisiana & Arkansas	279	114,492	14,544	133,018	27,085	24,300	3,030	33,533	.....	4,211	92,159	40,859	7,500	33,352	11,492
Midland Valley	380	86,581	31,822	125,267	26,078	16,916	2,071	39,161	.....	5,893	90,118	35,148	5,359	29,585	23,015
Missouri & North Arkansas	365	56,221	29,882	92,586	24,445	20,047	1,995	32,947	.....	4,927	84,361	8,225	5,800	2,423	2,784
Missouri, Oklahoma & Gulf	334	65,293	18,681	86,764	33,947	18,534	4,175	40,888	110	7,232	104,886	—18,121	5,128	—23,265	—27,047
Missouri, Oklahoma & Gulf Ry. of Texas	19	8,342	370	8,905	1,712	1,903	835	4,481	.....	640	9,570	—665	140	—804	—811

Traffic News

The Toledo Traffic Bureau has filed a complaint with the Interstate Commerce Commission, charging that the roads in putting into effect the order of the commission allowing them to increase rates five per cent have advanced rates from Toledo to Michigan points to a much greater extent.

The National Industrial Traffic League will hold a meeting at Toledo, Ohio, in the Zenobia Auditorium, on September 9 and 10. An informal dinner has been arranged for the evening of September 9 at the Toledo Club, at which E. E. Clark, of the Interstate Commerce Commission, will give an address.

The Eastern roads have filed tariffs showing advances in eastbound grain rates, and the Interstate Commerce Commission, suspending the tariffs, will hold a hearing on the subject at Washington, October 13. The most important advances are those on grain for export. Proposed changes in classification of freight will be heard at the same time.

For the movement of the Georgia peach crop to Eastern markets this year (May 27 to August 17), the Southern Railway ran 187 special trains from Atlanta to Washington, 649 miles, on fast passenger schedules, and 98.3 per cent of them reached destination on time. The total number of cars was 3,636; and 219 cars were sent to Western markets by 35 special trains from Atlanta to Chattanooga, all of which arrived on time.

The Union Pacific has announced that hereafter but one coupon will be required on tickets reading over two or more lines of that system. When this arrangement is fully effective it will be applicable to foreign interline, home interline and intersystem tickets. It will be some time, however, before tickets can be reprinted, and meantime the old forms with two or three coupons, as the case may be, will be honored. The object of this arrangement is to popularize the route with ticket agents of other roads.

Since its current passenger tariffs went into effect, the Boston & Maine has experienced a very notable diminution of travel. According to the Boston News Bureau there is one station near Boston where revenues have slumped to less than $100 a month from $400 formerly. At various stations traffic has disappeared altogether, or has gone to trolley companies or automobiles. In June the passenger revenues of $1,186,000 represent a decline of $164,000, or 12 per cent from June, 1914. Revenue passenger-train mileage was practically unchanged.

The steamship "Pennsylvanian," of the American-Hawaiian line, recently set a new record for time of transit from Philadelphia to San Francisco via the Panama canal, making the voyage in 14 days 17 hrs. 25 min. The distance is 5,130 nautical miles, making an average speed of about 348 miles a day. The Canal Record points out that if this vessel had made the voyage by way of the strait of Magellan, a distance of 13,003 miles, at the same speed, the voyage would have required approximately 37 days and 8 hours, or two and one-half times as long as the trip by way of the canal, and that the use of the canal saved about 5,965 bbl. of fuel oil, which would cost $4,772.

Three judges of the United States district court at San Francisco, Cal., heard arguments on August 17 and 18 on the petition filed by the chambers of commerce of San José, Stockton, Santa Clara and Sacramento, Cal., for an injunction to restrain the enforcement of the Interstate Commerce Commission's order in the intermountain fourth-section case, effective July 15, which denied the four cities named the advantage of terminal rates. The commission held that terminal rates should be made only to ports of call. Joseph W. Folk, general solicitor for the Interstate Commerce Commission, and Blackburn Esterline, special assistant to the attorney general of the United States, argued that the issuance of the injunction would upset the entire order, which is the result of years of litigation, and which permits the railroads to some extent to meet the competition of the Panama Canal. The railroad lawyers present agreed to stand by the argument made on behalf of the commission. The case was taken under advisement.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

Kentucky Cattle Rates Justified

Rock Spring Distilling Company, et al. v. Louisville, H. & St. L., et al. Opinion by Commissioner Clark:

Rates on cattle in carloads from Owensboro, Ky., to Chicago and New York, and points taking New York rates not found unreasonable or unjustly discriminatory; complaint dismissed. (36 I. C. C., 35.)

Discrimination at Henderson

Henderson Commercial Club v. Illinois Central, et al. Opinion by Commissioner Meyer:

The present adjustment of rates at the Evansville-Henderson river crossing is found unjustly discriminatory, and defendants are required to remove the discrimination. The carriers are required to provide for the rehandling of grain at Henderson, Ky., under the through rates from points in Illinois to Virginia cities, upon the same terms as at Louisville. (36 I. C. C., 20.)

Rates to Phoenix Regulated

Edward Eisle v. Atchison, Topeka & Santa Fe et al.

Complaints filed in 1912 attack rates to Phoenix, Ariz., from various points of origin on different kinds of groceries, hardware and other commodities. It is held that certain of defendants' rates on potatoes and onions are unreasonable; that the complaint against the other rates under attack has not been sustained, and that reparation will be denied. (This proceeding also embraces complaints in a half-dozen other cases. (36 I. C. C., 18.)

Lumber Rates From Wilson, Ark.

In re lumber rates from Wilson, Ark., and other points to Cincinnati, Ohio, and other points. Opinion by the commission:

The commission finds that the carriers have justified a proposed withdrawal of through rates on lumber from points of origin in Arkansas to Louisville, Ky., Cincinnati, Ohio, and Evansville, Ind. The rates from producing points west of the Mississippi to these destinations are normally on the basis of the lowest combination on Memphis or Thebes. The rates in issue are abnormally low, and were established to meet the competition of the barge lines. (35 I. C. C., 179.)

Rates on Wooden Building Material

Yellow Pine Sash, Door and Blind Manufacturers' Association et al. v. Southern Railway et al. Opinion by Commissioner Clark:

The commission finds that the rates on wooden building material from and to points in southern classification territory should bear a uniform relation to the rates on lumber. It is unable to establish or order the establishment of proper differentials from the facts of record. The matter is being taken up, however, in the general investigation of the rates on and classification of lumber and lumber products in docket No. 8131. (35 I. C. C., 151.)

Southern Pig Iron Rates Reduced

Sloss-Sheffield Steel & Iron Company et al. v. Louisville & Nashville et al. Opinion by Chairman McChord:

Following the principle of the original report in this case, 30 I. C. C., 597, it is held that the rates on pig iron in carloads from points in Alabama and Tennessee to points reached by defendants' lines in Central Freight Association territory, to which pig-iron rates were not reduced on October 1, 1914, are unreasonable. Reasonable rates are prescribed for the future, and divisions of such rates between the carriers operating north and those operating south of the Ohio river are prescribed. (35 I. C. C., 460). [The list of carriers who are defendants in this case fills ten pages.]

Coal Rates From Oak Hills, Colo.

Opinion by the Commission:

In its original report (30 I. C. C., 505) the commission required the establishment of joint rates on bituminous coal from Oak Hills, Colo., on the Denver & Salt Lake through Denver to stations on the Rock Island in Kansas, Nebraska and Missouri. The rates were to be on the basis of the rates then in effect from the Walsenburg, Colo., coal district, via Pueblo and the Rock Island to the same destinations. The carriers being unable to agree as to divisions, the commission finds that the Moffat road * * * to divisions on coal, soft, all kinds, but not slack and pea, of $1 18 a ton, and on coal, soft, nut, slack and pea of $1.12 a ton. (35 I. C. C., 456.)

Stopping Cars to Complete Loading

Investigation and Suspension Docket No. 549. Opinion by Commissioner Daniels:

Carriers in Central Freight Association and Western classification territories proposed to discontinue generally the practice of stopping cars in transit to complete loading, or partially to unload; but protest was made by the National Industrial Traffic League, and others, and the commission now finds that the proposed withdrawal of the practice is not justified. Small manufacturers and small merchants testified that only by means of the stop-over privilege could they fairly compete with large concerns; and the commission finds that the stop-over privilege tends to engender wholesome competition. Commissioner Harlan dissents, and will later file a separate report. (36 I. C. C., 130.)

Foreign Commerce Not Touched by I. C. Law

John S. Seymour v. Morgan's Louisiana & Texas et al. Opinion by Commissioner Hall:

Following U. S. v. P. & R. (188 Fed., 484) it is held that the transportation of sugar from Germany, through the United States, in bond, to destinations in Mexico, is not subject to the jurisdiction of the commission. This case had to do with 1,200,000 lb. of sugar shipped from Germany through New Orleans in 1913 for final delivery at points in Mexico. In a similar case —a cargo of sugar from Hamburg, Germany, shipped to Philadelphia on its way to Raymond, Alta.—the United States District Court for the Eastern District of Pennsylvania, decided that such a transaction would not be within the mischief which the act to regulate commerce was intended to remedy, and would not come within the language of the statute. (35 I. C. C., 492.)

Atlanta and Nashville Treated Alike

W. S. Duncan & Company et al. v. Nashville, Chattanooga & St. Louis et al. Opinion by Commissioner Clements:

This decision concerning rebilling privileges at Nashville, Tenn., and discrimination against Atlanta, Ga., and nine other places virtually revives the commission's decision of June 9, 1911, which was suspended by the Commerce Court, but later approved by the Supreme Court. The Supreme Court of the United States announced its decision on December 7, 1914, reversing the order of the commerce court, which order set aside the order of the commission requiring the removal of unjust discrimination resulting from the granting to Nashville, and the denial to Atlanta and nine other complaining cities in Georgia of the privilege of rebilling or reshipping grain, grain products and hay transported from the Ohio and Mississippi river crossings or beyond, and destined to points in the southeast, at the through rate from origin to final destination. Upon consideration of the record in the original hearings and in the recent hearings, and on the applications of the carriers under section 4, it is now held that the granting of the said privilege to Nashville and the denial of it to Atlanta and the other complaining cities results in a violation of section 3, and that no showing has been made, under

either section 3 or section 4, why the commission should not enter an order in substantial conformity with the order of June 9, 1911, and it is so ordered. (35 I. C. C., 477.)

Reconsignment by Telephone Disapproved

S. F. Scattergood & Co. v. Erie & Western Trans. Co., et al. Opinion by the Commission:

Messrs. Scattergood complained of a reconsignment charge of $2, made at Renovo, Pa., on a carload of bran which came from Minneapolis, Minn., but the commission justifies the railroad and dismisses the complaint. Complainants, in Philadelphia, telephoned the railroad company, the Pennsylvania, in Philadelphia, June 17, to divert the car to New York; and confirmed the order in writing two days later. This delay of two days necessitated a charge of $2. Complainant contends that the Pennsylvania Railroad's receipt of the telephone message of June 17, to reconsign the shipment, within 24 hours after the date of the arrival of the car at Renovo, satisfied the requirements of the tariff for free reconsignment. But the commission, finding that the tariff requirement of a written order was not observed, and that carriers never can be certain that the person speaking a diversion or reconsignment order by telephone has control of the bill of lading, holds that the charge assailed was lawfully applicable; and the complaint is dismissed. (36 I. C. C., 15.)

The Iron and Steel Cases; Advances Approved

Commercial Club Traffic Bureau (Salt Lake) v. Atchison, Topeka & Santa Fe et al. Opinion by Commissioner Harlan:

Proposed readjustment of the rates on iron and steel articles moving from Mississippi river points, Missouri river points, Chicago and territory intermediate to Chicago and the Missouri river, on the one hand, to Utah and Colorado points and to points in Kansas, on the other, found justified except as to the rates on certain iron and steel articles to Colorado points. Existing rates on iron and steel articles from Pittsburgh and St. Louis to Hutchinson, Wichita and Topeka, Kans., not shown to be unreasonable or unjustly discriminatory. Proposed readjustment of rates on iron and steel articles from St. Louis and from Pittsburgh and other points in Central Freight Association territory to points in Oklahoma and to Fort Smith, Ark., found justified.

This is a group of cases involving substantially all the rates on iron and steel articles from Central Freight Association, Mississippi river, Missouri river, Chicago, and territory intermediate to Chicago and the Missouri river on the one hand, to points in Utah, Colorado, Arkansas, Kansas and Oklahoma on the other hand.

The opinion fills 20 pages and deals with everything made of iron, from boiler plate to woven wire fence, hay bale ties, hinges and sucker rods. Twelve different orders have been issued. (36 I. C. C., 86.)

Water and Rail Rates from Yonkers

Federal Sugar Refining Company v. Central of New Jersey et al. Opinion by Commissioner Hall:

Yonkers is 16 miles north of New York City. Complainants send sugar to Pennsylvania and other points west by way of the New York Central to Sixtieth street, New York, whence it is transferred across the harbor by boat to the Central of New Jersey. Complainants desire to send by boat direct from Yonkers to the New Jersey terminus, declaring that there is much delay at Sixtieth street. Sometimes cars have to wait ten days before they can be taken across the harbor. They ask that through rates be made by the Central of New Jersey with the Ben Franklin Transportation Company, a responsible concern operating boats on the Hudson river and in the harbor; and this request is granted, the commission ordering the railroad to join the boat company in through rates; the rates to points 90 miles and more distant from Jersey City to be the same as from New York; which is what is provided for by the through tariffs over the New York Central and the Central of New Jersey now in effect; and it is ordered that the rates by the new route shall be no higher than those made by the two railroads. Rates are ordered for only one commodity, sugar. The railroad argued that a single shipper, sending a single commodity, could not legally demand the establishment of a through route; but the commission finds that there are other shippers who may take advantage of the new route. The railroad also claims that the same issues had been decided by the courts in former proceedings, but the commission says that this technical plea has no application to an order of the commission; moreover, it is held that the question of establishing a through route and joint rates was not determined in the former case cited.

Rates Prescribed for Valuable Animals

Iowa State Board of Railroad Commissioners, et al. v. Atchison, Topeka & Santa Fe, et al. Opinion by Commissioner Hall:

Applying to the present record the principles enunciated in The Cummins Amendment, 33 I. C. C., 682, *Held:* (*a*) That, taking each class of animals by itself and making due allowance for the minimum, maximum and average values of each as shown by this record, the scheduled valuations carried by these defendants in their live stock shipping contracts are unjustly and unreasonably low and not representative of the average actual values of the animals shipped thereunder; (*b*) that defendants' rates for the transportation of certain specified animals, the actual values of which do not exceed the amounts set forth in the report, are, and will be for the future, unreasonable to the extent that such rates exceed the present rates based upon the present scheduled valuations; (*c*) that defendants' excess rates for excess valuations are unjustly and unreasonably high, and (*d*) that reasonable rates for the transportation of any animal of actual value exceeding the amount specified in the report will exceed said present rates by not more than 2 per cent of said present rates for each 50 per cent or fraction thereof of actual value over and above that named in the report. This proceeding was brought by the Iowa State Board of Railroad Commissioners and by the American National Live Stock Association, the Corn Belt Meat Producers' Association, and the Cattle Raisers' Association of Texas, organizations whose members are producers or shippers of live stock. Some 45 carriers are named as defendants. The railroad commissioners of South Dakota, Colorado and Arizona and a number of live stock exchanges and associations intervened in support of the complaint.

The commission finds that the average values of the different kinds of live stock at the present time are greatly in excess of the valuations named in the carriers' printed contracts. . . . The percentage of increase in rate for excess value has varied from 10 to 25 per cent of the released rate for each 100 per cent or fraction thereof of excess value. These excess rates for excess value have seldom been used.

It has long been the claim of the carriers that the amounts paid by them for damage incident to the transportation of live stock are disproportionately high as compared with the damage claims incident to the transportation of other freight. It does not appear, however, that all such claims are affected by these particular contracts. A large proportion—perhaps 85 per cent in amount—is on account of loss of market and incidental shrinkage in weights and value of the live stock. Such losses never do and never can equal the valuations named in the contracts. Only about 15 per cent of the total claims paid by the carriers for loss of or injury to live stock are, therefore, in any way affected by the rules and regulations here in issue. The amount of money actually paid by these defendants because of such loss or injury does not average more than 25 cents a car.

During the last two years long established insurance companies have entered the business of insuring shipments of live stock in transit. Their policies protect against loss by death or other total loss in excess of the legal liability therefor of the railroad or carrier caused by wreck, derailment, fire or lightning while on cars in transit. The rates of these companies are 50 cents per single-deck and 75 cents per double-deck car, and the indemnities specified are $50 for each steer, $30 for each cow, $10 for each calf, $10 for each hog and $5 for each sheep or goat. The insurance rates are flat rates per car, regardless of whether the haul be long or short. For an additional premium of 25 cents or 50 cents per car, making in all 75 cents

or $1 per car, the indemnity on steers is made, respectively, $75 or $100 per head. While there are no statistics of such insurance operations before us, the testimony as to the amounts paid for commissions and overhead expenses would indicate that the business is profitable.

It is of record that the average haul of live stock in the United States pays the carriers about $50 per car in freight charges.

The defendants did not contend that the excess rates charged on account of excess value were reasonable, and they offered another schedule of rates in lieu thereof. That offer is in substance that for a 3 per cent excess rate the carrier will assume a 50 per cent excess liability, and that for a 5 per cent excess rate the carrier will assume a 100 per cent excess liability. These figures are not based upon the cost of additional insurance alone. They rest also upon the theory that the carriers' service on the higher valued animals is a more valuable service and should be compensated by a higher rate.

This proposal is rejected and the commission finds, as above, that the charge for excess value must not exceed normal rates by more than 2 per cent for each 50 per cent of actual value. (36 I. C. C., 79.)

STATE COMMISSIONS

At a hearing before the Railroad Commission of Michigan on August 24, on the application of the express companies for permission to increase their intrastate rates to conform to the interstate rates allowed by the Interstate Commerce Commission, the Grand Rapids Chamber of Commerce was the only protestant.

Application has been made to the California Railroad Commission by the Southern Pacific, the Atchison, Topeka & Santa Fe, the San Pedro, Los Angeles & Salt Lake, the Western Pacific and the Western Association of Short Line Railroads for such relief as the commission can grant under a state law prohibiting railroads from requiring their trainmen to receive or transmit train orders over the telephone.

COURT NEWS

Limitation of Time for Commencing Action for Damage to Freight

The Kansas Supreme Court holds that a stipulation in a contract for an interstate shipment of cattle that an action by the shipper to recover damages because of injuries and delays occurring during the transportation must be commenced within 91 days after the happening of the injuries and delays is not unreasonable nor invalid. Mere negotiations between the parties as to settlement or compromise of the claim did not waive the contract limitation nor estop the railroad from insisting that the right to sue had been lost by lapse of time.—Ray v. Missouri, K. & T. (Kan.), 153 N. W. 397.

Measure of Damages for Injuries to Live Stock

A shipment of cattle was negligently delayed so that the cattle suffered excess shrinkage. The cattle brought the market price; the only loss suffered by the shipper was in lost weight. The Texas Court of Civil Appeals holds that, as the measure of damages is the difference between the market value of the cattle at the time and in the condition in which they were delivered and their value if delivered in time, the shipper, having recovered for shrinkage, could not also recover for loss in selling appearance. That would allow a recovery of double damages for the same item.—International & G. N. v. Rhoden (Tex.), 177 S. W. 984.

Crossing Accident—Contributory Negligence

In Missouri a pedestrian in crossing a railroad at night along a board walk was struck and killed by a train going 40 miles an hour. He had an unobstructed view when 9 feet from the track. The train had been running every night for years, near his place of business, at a greater speed than 30 miles an hour. There was an ordinance of the town through which the line ran, which consisted of about 651 inhabitants, limiting the speed of trains to 8 miles. It was held that the deceased had no right to assume that the train was going no more than 8 miles an hour and was guilty of contributory negligence as a matter of law.—Vandeventer v. Chicago & A. (Mo.), 177 S. W. 834.

Hours of Service Act—Deduction of Lay-Off Time

In an action for penalties for permitting a train crew to remain on duty for more than 16 consecutive hours, in violation of the hours of service act, the Circuit Court of Appeals, Ninth circuit, holds that where a train is delayed en route to its destination, and the members of the train crew are laid off and released from duty during the period of the delay, the lay-off or release breaks the continuity of the service, and the period of such lay-off should be deducted in determining whether there has been a violation of the act, if it is for a substantial and opportune period of rest.—Southern Pacific v. United States, C. C. A., 222 Fed. 46.

Hours of Service Act—Omissions in Reports

A railroad inadvertently and honestly omitted from its report, required by order of the Interstate Commerce Commission, pursuant to the interstate commerce act, instances in which employees were permitted to remain on duty for a longer period than that prescribed by the hours of service act. The Circuit Court of Appeals, Ninth circuit, holds that the company was not subject to the penalties imposed by the interstate commerce act, but any omissions must be scrutinized, so as to prevent any evasions of the requirements to make reports in such instances.—Oregon-Washington R. & Nav. Co., C. C. A., 222 Fed. 887.

Notice of Intention to Claim Damages

The Arkansas Supreme Court holds that a provision in a bill of lading requiring written notice of intention to claim damages to be given to the carrier is reasonable. Where no written notice is given, the burden is on the plaintiff to show that the railroad had such actual knowledge. Compliance with the rule was not excused by the fact that some employee of the carrier whose duties did not include the investigation of such matters or the report thereof to the agent, knew of the damaged condition of the goods, no agent in authority knowing that the shipment was damaged or that a claim would be made.—St. Louis, I. M. & S. v. Cumbie (Ark.), 177 S. W. 910.

Caretaker of Stock a Passenger for Hire

A shipper of horses was handed a live-stock contract which contained the condition that the shipper should feed and care for the animals and exempted the railroad from liability for their escape from the car. The shipper, who accompanied the stock as caretaker, was injured by a derailment. In an action against the railroad the circuit court of appeals, Fourth circuit, holds that the contract showed that it was in the interest of the railroad to have a caretaker in charge and that this was a sufficient consideration for his transportation. He was, therefore, a passenger for hire and the railroad could not by a further provision exempt itself from liability for his injury through its negligence. Norfolk Southern v. Chatman, C. C. A., 222 Fed. 802.

Drainage Assessment Apportionment

A railroad company was assessed $1,500 towards the cost of a drainage system on about two miles of right of way within the drainage district. The total cost of the drainage system was $91,000. The district court reduced this assessment to $800. On appeal, the Iowa Supreme Court affirmed this judgment, holding that where the total cost of a drainage system is less than the total benefits therefrom, the tax on a particular taxpayer should bear the same proportion as the total cost bears to the total benefits; and, therefore, where the benefits were considerably in excess of the cost, but the assessment against the right of way was for the full benefit accruing to the railroad, the assessment was properly reduced in proportion to the excess. Chicago & N. W. (Iowa), 153 N. W. 110.

Liability for Injuries Received While Extinguishng Prairie Fire Caused by Sparks

A prairie fire was negligently caused by a railway company, and the wife of a homesteader who was left at home with her

daughter used every reasonable effort to put out the fire. In so doing she overworked and strained herself so that permanent injuries ensued. In an action against the railroad the North Dakota Supreme Court holds that she could recover damages from the company provided she did not unreasonably and recklessly expose herself to the injury. Whether she was reckless and negligent in this respect was primarily a question of fact for the jury and not of law for the court. The jury found for the plaintiff.—Wilson v. Northern Pacific (N. D.), 153 N. W., 430.

Order of Commission Compelling Operation at Loss—Reasonableness

Action was brought by the Saline River Railway Company against the Arkansas Railroad Commission to restrain the commission from proceeding to compel the company to operate its line. It appeared that the road, which was primarily built to haul logs, was nine miles long, running between two small towns, through sparsely settled territory. It had originally cost $75,000, owed between $100,000 and $150,000, owned no property except tracks and rolling stock, the track being badly out of repair. The company had tried unsuccessfully to sell the franchise and property for $18,000. The Arkansas Supreme Court holds that an order of the commission requiring the company to run one passenger and freight train each way daily, at an expense of $50, while its greatest possible revenue per day was not more than $10, was so unreasonable as to be void. —Rowland v. Saline River (Ark.), 177 S. W., 896.

"Railroad Hazard" Defined

An employee, engaged in taking old brasses out of journal boxes of cars, used, instead of a jack, a pole to force down a wheel. This is a less safe method, but customary when all available jacks are in use. The pole slipped and struck him in the side. In an action for his injury the Arkansas Supreme Court holds that he assumed the risk thereof, since, appreciating the danger, he deliberately chose this manner of doing the work. The Arkansas act of 1911, fixing the liability of railroads for injuries to employees, and abolishing the defense of assumption of risk, did not apply to the plaintiff. The act does not include all railroad employees engaged in every department of the service, but only those whose duties expose them to the characteristic dangers connected with the operation of railroads known as "railroad hazards," which are those peculiar dangers to which employees are exposed while engaged in work connected with, and necessary to, the operation or running of trains.—St. Louis, I. M. & S. v. Wiseman (Ark.), 177 S. W. 1139.

Safety Appliance Act—Automatic Couplers

Through an accident the automatic coupling on the front end of a locomotive became inoperative to the extent that the uncoupling device was out of commission, though the coupling feature remained intact and operative. The engine was used for some time in this condition, employees being notified that the front coupler should not be used, and no car was coupled to the front end. Had a car been so coupled to the front end it would have coupled automatically and could have been uncoupled, without going between the car and the engine, by the use of the uncoupling device on the car. In an action for the statutory penalty the Federal District Court, E. D. Pennsylvania, held that the company violated the safety-appliance act, since, while a locomotive engine need not be so designed that cars may be coupled at its front end, if intended in its use to be coupled at either end, it must have an uncoupling device at each end.—United States v. Reading, 223 Fed., 215.

Contract Exemption from Liability for Injury to Pullman Porter

The Pennsylvania Supreme Court, following its decision in Coleman v. Pennsylvania (1913), 242 Pa. 304, 89 Atl. 87, 50 L. R. A. (N. S.) 432, holds that a Pullman car porter, though not a passenger in the ordinary sense, is entitled to the rights of a passenger to safe transportation, and, though his employment contract purports to release the Pullman Company and railway company, he may recover from the latter for injuries resulting from the negligence of its servants. Murray v. Reading (Pa.), 94 Atl., 558.

The great weight of authority upholds the contrary doctrine sustaining contracts exempting railroad companies from liability for negligent injury to sleeping-car employees or others maintaining a similar relation to the carriers, such as employees of express companies, circus proprietors or news companies. The latest case on the subject holding such a contract valid is that of Robinson v. Baltimore & Ohio, recently decided by the United States Supreme Court, 35 Sup. Ct., 491, an abstract of which appeared in our issue of April 23, page 907.

Passenger Entering Wrong Train

In an action for damages by a passenger who had got on the wrong train and was carried six miles to the next stopping place notwithstanding his request to be let off when his mistake was discovered, the Alabama Supreme Court stated the law as follows: Where a person has regularly bought a ticket to a definite destination, and mistakes, in good faith, the train on which he has the right to be carried, and enters the wrong train, he is a passenger until, after being informed of his mistake, his conduct renders him a trespasser; and is entitled to the protection accorded passengers against negligence for which the railroad is responsible. It cannot be affirmed, as a matter of law applicable under all circumstances, what would be or is a proper place for affording the passenger an opportunity to disembark or to eject him. The schedule of the train, with reference to which nearby trains opposed or following were being operated, might suggest, in all proper prudence, the danger of stopping the trains between stations. The nearness of the next station after the discovery of the passenger's error might, in and of itself, entirely justify the conductor in taking the passenger to that not remote station. Other illustrative circumstances may be readily supposed."—Southern v. Farquhar (Ala.), 68 So. 289.

Local Assessment of Station Property for Street Improvement

A city attempted to assess the station property of a railroad for the widening of an adjacent street. While the authorities in the various jurisdictions are not in accord as to whether station property can be assessed for the improvement of an adjoining street, the New York Appellate Division holds that the sounder rule is that which denies the right. There were two offices on the property, one rented to a news company and the other to a real estate dealer. The court said: "The theory of local assessment is benefit. And the reason for exemption rests in the inability to perceive how such premises are made by the improvement any more valuable for the purposes for which the railroad company can use them. The widening of the street presumably improves it for travel and for access; but the railroad is not benefited in that it carries more passengers or receives a greater compensation. To assess this railroad station property for the reason that the widening of the street might make such office space in its station more valuable is, I think, assessing for benefits too remote and too speculative, and is to destroy the rule by refinement." People v. Waldorf, 153 N. Y. Supp., 1072.

Safety Appliance Act—Moving Defective Car to Shop

A switchman, employed by a railroad engaged in interstate commerce, was injured because of a defective grabiron on a boxcar which was waiting to be taken to the shop for repairs. There was nothing to prove that the defect could not have been repaired without taking the car to the shop. It was held by the circuit court of appeals, Fifth circuit, that the railroad was liable under the safety-appliance act.

Pardee, C. J., dissented on the ground that the act is intended to apply only to cars, etc., *in use* at the time. "It could hardly have been intended by the Congress," he said, "that a railroad company under heavy penalties should keep its cars in perfect order, with certain specific safety appliances and otherwise, and yet that, after a disabled car has been taken entirely out of commerce, not to be used for any traffic whatever, the railroad company is to be penalized in favor of employees fully advised and warned that the car was in bad order or was to be moved only to the shop for repairs, for taking the only practical means at hand to have the car repaired and put in order." Texas & P. v. Rigsby, C. C. A., 222 Fed., 221.

Railway Officers

Executive, Financial, Legal and Accounting

H. J. Simmons, who recently resigned as general manager of the El Paso & Southwestern on account of ill health, will continue as a director and vice-president of the El Paso & Northeastern and the El Paso & Southwestern of Texas, and as a director of the Tucson, Cornelia & Gila Bend.

E. A. Murphy, assistant freight auditor of the Chicago, Milwaukee & St. Paul at Chicago, has been appointed freight auditor, and W. W. Scannell, chief clerk to the freight auditor, succeeds Mr. Murphy. Francis J. Owens, connected with the accounting department of the Chicago, Milwaukee & St. Paul, has been appointed auditor of the Chicago Union Station Company, and F. E. Allen, traveling accountant of the Chicago, Milwaukee & St. Paul at Chicago, has been appointed auditor of expenditure, vice C. E. Dudley, resigned. Mr. Dudley retires after forty-seven years of service. Effective September 1.

Perry McCart, who has been appointed general attorney for the Chicago, Indianapolis & Louisville, to succeed H. R. Kurrie, was born near Orleans, Orange county, Ind., November 5, 1864. He was educated in the common schools of Orange county, in Orleans High School, Southern Indiana Normal College, Mitchell, Ind., and in the law department of the University of Tennessee, Knoxville, Tenn. In 1897 he was a member of the house of representatives of the Indiana legislature. For a number of years he has served as local attorney for the Chicago, Indianapolis & Louisville. He will make his headquarters in Chicago.

Operating

J. J. Sexton, trainmaster of the Northern Pacific at Glendive, Mont., has been transferred to Billings, Mont., vice R. R. Auerbach, promoted. William C. Sloan has been appointed trainmaster with headquarters at Forsyth, Mont., vice Thomas M. Flynn, transferred.

Thomas B. Turner, trainmaster of the Louisville & Nashville, at Mobile, Ala., has been appointed assistant superintendent with headquarters at Mobile, succeeding John Bose promoted, and J. P. Semmes has been appointed trainmaster of the New Orleans & Mobile division, with headquarters at Mobile, succeeding Mr. Turner.

F. C. Huntington, trainmaster of the Northern Pacific at East Grand Forks, Minn., has been appointed superintendent of the Fargo division, with headquarters at Dilworth, Minn., vice F. R. Bartles, who has been appointed superintendent of the Minnesota division, with headquarters at Staples, Minn., vice T. F. Lowry, transferred. T. F. Lowry has been appointed superintendent of the Rocky Mountain division, with headquarters at Missoula, Mont., succeeding F. L. Birdsall, resigned. Effective September 1.

Traffic

S. A. Williams has been appointed general agent, traffic department of the Chicago & Alton, at Peoria, Ill., vice E. J. Naylor, resigned.

William T. Price, traveling freight agent of the Union Pacific, with headquarters at Denver, Col., has been appointed commercial agent at Pueblo, Col.

A. C. Littlejohn, traveling freight agent of the Queen & Crescent Despatch, has been appointed commercial agent, with headquarters at New Orleans, La., vice A. B. Collins, transferred.

Frank Roach, chief clerk of the advertising department of the Union Pacific Railroad at Omaha, has been appointed advertising agent of the road, to succeed John T. Cummins, promoted.

T. O. Jennings, general freight agent of the Chicago & Eastern Illinois, has been appointed freight traffic manager, with headquarters at Chicago; E. S. Stephens, assistant general freight agent, has been appointed general freight agent, with headquarters at Chicago; G. H. Kummer, coal freight agent, has been appointed assistant general freight agent; F. E. Webster, chief of the tariff bureau, has been appointed assistant general freight agent, and J. J. Clask has been appointed chief of the tariff bureau, effective September 1.

Engineering and Rolling Stock

W. W. Warner, general foreman of the Erie car repair shops at Marion, Ohio, has been promoted to the general foremanship of the steel car repair shops at Cleveland. Effective September 1.

E. S. Mudge, division engineer of the Atchison, Topeka & Santa Fe at Wellington, Kan., has been appointed assistant engineer in charge of valuation of the western lines, with headquarters at Amarillo, Texas.

C. D. Perry, assistant road foreman of engines of the Delaware & Hudson, has been appointed road foreman of engines with office at Oneonta, N. Y., vice O. E. Ackart, assigned to other duties.

R. D. Starbuck, special engineer on the staff of J. J. Bernet, vice-president of the New York Central at Chicago, has been transferred to New York as special engineer on the staff of A. T. Hardin, vice-president in charge of operation at New York.

OBITUARY

Robert Finney, general agent of the Baltimore & Ohio at Pittsburgh, Pa., died on August 24 at the St. Francis hospital in that city.

W. F. Stevenson, general agent of the freight department of the Canadian Pacific at New York, died on August 21, in that city, at the age of 60.

John Finnell, roadmaster of the Northern Pacific at Tacoma, Wash., was killed recently when the track motor car on which he was riding left the rails.

Edward F. McCrea, division engineer of the Northwest System of the Pennsylvania Lines West of Pittsburgh, with headquarters at Cleveland, died of cancer at the home of his parents in Logansport, Ind., on August 29.

Sidney T. Emerson, formerly well known as a civil engineer in railway construction work, died at his home in Chicago on August 30, aged 88 years. He served as consulting engineer for the Pennsylvania, the Missouri Pacific, Northern Pacific and the St. Louis, Kansas City & Colorado.

John H. Warder, secretary Western Society of Engineers since January 10, 1901, died at his home in Chicago on August 30, following a short illness. He was born in Cincinnati, Ohio, on January 21, 1846, and graduated from the Polytechnic College of Philadelphia in 1867 as a mechanical engineer. He was for some time connected with the Cincinnati Southern and with the bridge department of the Chicago, Milwaukee & St. Paul. He was also engaged for some time in bridge inspection at various points throughout the United States. He designed the waterworks system for West Pullman, Ill., in 1893, and following this he was in charge of sewer construction in Lake View and other parts of Chicago, until his election as secretary of the Western Society of Engineers.

J. G. Metcalfe, formerly president of the Mexican International (June, 1902, to April, 1904), and then for one year vice-president of the National Lines of Mexico, died on August 31 at Pocono Summit, Pa., at the age of 67. He had lately been connected with Speyer & Company, bankers, New York City. He was born in Cambridge, Ohio, and began railway work as a telegraph operator. He subsequently served as superintendent of the Louisville & Nashville and lines now forming part of that road. From July, 1900, to November, 1901, he was general manager of the Denver & Rio Grande; then to June, 1902, was general manager of the Evansville & Terre Haute, when he became president of the Mexican International and subsequently vice-president of the National Lines of Mexico. In 1905, Mr. Metcalfe became a consulting expert on railroad matters and was appointed vice-president of the Manila Railway Company, which position he held at the time of his death. He was also vice-president of the Bolivia Railway Company, and a director of the Missouri Pacific.

Equipment and Supplies

LOCOMOTIVE BUILDING

The Chicago & North Western is in the market for 34 locomotives.

The Erie has ordered five Santa Fe type locomotives from the American Locomotive Company.

The Utah Copper Company has ordered six 6-wheel switching locomotives from the Baldwin Locomotive Works.

The Garden City Western, Garden City, Kan., has ordered one Mogul type locomotive from the Baldwin Locomotive Works.

The Servian Government has ordered 15 Prairie type locomotives from the American Locomotive Company. These locomotives will have 19 by 24-in. cylinders, 53-in. driving wheels and a total weight of 143,000 lb.

The American Railroad Company of Porto Rico has ordered three Consolidation type locomotives from the American Locomotive Company. These locomotives will have 14-in. and 20 by 20-in. cylinders, 37-in. driving wheels and a total weight of 83,000 lb.

CAR BUILDING

The San Pedro, Los Angeles & Salt Lake is inquiring for five caboose cars.

The Wyoming Coal Company has ordered 50 mine cars from the Pressed Steel Car Company.

The Atlantic Coast Line has contracted with the Pullman Company for a private car.

The Interborough Rapid Transit has ordered 489 sets of trucks from the Pullman Company.

The Western Maryland is in the market for 1,000 all-steel hopper cars and also for a few box cars.

The Maine Central has ordered 1,500 center constructions from the Standard Steel Car Company.

The Tennessee Coal, Iron & Railroad has ordered 10 tank cars from the Pressed Steel Car Company.

The Illinois Steel Company has ordered 10 tank cars from the American Car & Foundry Company.

The Pittsburgh Crucible Steel Company has ordered 18 flat cars from the Pressed Steel Car Company.

The Utah Copper Company has ordered 50, 30-yd. extension side dump cars from the Clark Car Company.

The Nashville, Chattanooga & St. Louis has ordered 200 box cars from the American Car & Foundry Company.

The Central Steel Company has ordered one 20-yd. extension side dump car from the Clark Car Company.

The Anaconda Copper Mining Company has ordered ten 20-yd. extension side dump cars from the Clark Car Company.

The Jones & Laughlin Steel Company has ordered 20, 100-ton side dump, side hopper cars from the Clark Car Company.

The Edmonton, Dunvegan & British Columbia has ordered 10 stock cars from the National Steel Car Company, Hamilton, Ont.

The Alberta Great Waterways and the Edmonton, Dunvegan & British Columbia have ordered 100 box cars from the Canadian Car & Foundry Company.

The Cleveland Cliffs Iron Company has ordered six center dump ore cars from the Clark Car Company. These cars will be built by the Cambria Steel Company.

The Illinois Central has ordered 300 underframes from the Haskell & Barker Car Company and has let the contract for repairing 1,000 gondolas to the American Car & Foundry Company.

The Atchison, Topeka & Santa Fe, reported in an unconfirmed item in the *Railway Age Gazette* of August 27 as having ordered 50 ore and concentrate cars, has ordered 25 concentrate cars from the Pullman Company and 25 ore cars from the Western Steel Car & Foundry Company.

IRON AND STEEL

The Seaboard Air Line has ordered structural steel work amounting to about $50,000 for its new shops at Portsmouth, Va., from the Virginia Bridge & Iron Company.

The Vandalia has ordered from the Wisconsin Bridge & Iron Co. five 113-ft. 3-in. single-track through-riveted truss spans, totaling 560 tons, for a bridge at Logansport, Ind.

The Central of New Jersey's order for 800 tons of fabricated steel for a pier to be built on the North river, New York, has been given to the Pennsylvania Steel Company.

The Philadelphia (Pa.) Subways has ordered 8,500 tons of steel from the Keystone Construction Company for the first section of this line and an additional 24,000 tons will be ordered shortly.

The Chicago, Milwaukee & St. Paul has let a contract for 314 tons of steel to the American Bridge Company, to be used on track elevation work for subways at Pratt avenue, Ashland avenue and Fargo avenue, in Chicago. The St. Paul has also ordered 134 tons from the same company for steel work on substations in various locations.

The New York Public Service Commission, First district, has awarded contracts for track materials, to be used upon various lines of the Dual Rapid Transit System, as follows: Untreated ties and timber, J. H. Burton & Co., $1,273,856; treated ties and timber, Long Leaf Pine Company, Inc., $100,362; special work, order No. 3, Ramapo Iron Works, $54,960; order No. 4, Wm. Wharton, Jr. & Co., $41,907; cast iron, American Brake Shoe & Foundry Company, $10,528; screw spikes, American Iron & Steel Manufacturing Company, $25,741; felt pads, The Q. & C. Co., $9,957; malleable iron, Foran Foundry & Manufacturing Company, $36,118; tie plates, type A—Herbert W. Lockwood, $123,975; type B—L. D. Rockwell, $13,267; type C—L. D. Rockwell, $5,140; type D—Herbert W. Lockwood, $8,239; types E, F, G and H—Herbert W. Lockwood, $17,139; types E-2, W and X—Ramapo Iron Works, $2,901; cut track spikes, Herbert W. Lockwood, $34,338; bolts and nuts, Oliver Iron & Steel Company, $117,910.

MACHINERY AND TOOLS

The American Car & Foundry Company is in the market for a number of engine lathes, axle lathes and other equipment for its Detroit plant.

French Railways in Turkey.—Press despatches report that the Turkish government authorities have been authorized to buy back the following French railway and tram lines in Syria, the purchase money to be provided by the ministries of finance and the Wakuf Pious Foundations: The narrow gage railway from Beirut to Zeirib; the tramway from Beirut to Hamslekin, in the Lebanon; the Rejak-Aleppo line to the junction with the Bagdad Railway; the line from Homs-Tripoli to the harbor of Muaivene; the line from Jaffa to Jerusalem, and all the rolling stock, workshops and other properties of these lines.

Hungarian Railways.—The Hungarian State Railways operate 5,505 miles of line and in April earned $5,961,068, comparing with $6,593,088 in April, 1914. The total receipts from July 1, 1914, to April 30, 1915, were $60,774,001, comparing with $69,369,838 for the corresponding period of the previous year.

A Sample of Russian Freight Rates.—A new tariff has been put into effect on shipments of tanning materials from Vladivostok to railway points west of Omsk. The rate on L.C.L shipments is from 2.7 cents to 1.6 cents per ton per mile. For carload shipments the rate varies from 2 cents to 7 mills per ton per mile.

Supply Trade News

The Chicago Malleable Castings Company, West Pullman, Chicago. is enlarging its plant.

Bertram Smith has been appointed manager of the Detroit office of the Edison Storage Battery Company, Orange, N. J. For the last year and a half Mr. Smith has been assistant manager of the Edison Storage Battery Supply Company, San Francisco, Cal., which company acts as the Pacific coast distributer for the Edison nickel-iron-alkaline battery. Previous to his connection with the Edison company he was manager of the battery department of the Chicago branch of the United States Light & Heating Company, New York. He had been secretary and treasurer of the National Battery Company, Buffalo, until its consolidation with the United States Light & Heating Company. The Edison Storage Battery Company recently moved its office from Cleveland to Detroit. The company's business in this territory has been rapidly increasing.

Bertram Smith

The Boss Nut Company, Chicago, has moved its offices from the Railway Exchange building to 1744-48 North Kolmar avenue.

C. B. Bouton, formerly president of the Union Foundry Works, Chicago, died at his home in that city on August 26.

William Graver, president of the William Graver Tank Works, East Chicago, Ind., died at his home in Chicago on August 26.

The Thorn Railroad Tie Company of Indianapolis, Ind., has been incorporated with a capital of $80,000, and will manufacture railroad ties.

The Franklin (Pa.) plant of the American Steel Foundries, which has been closed for several months, opened on September 1.

Alexander Wilson, for many years superintendent of the railroad department of the Cambria Steel Company, died at his home in Johnstown, Pa., on August 30 at the age of 75.

J. W. H. James, for many years connected with the American Bridge Company, and a civil and mechanical engineer of broad experience, died at his home in Chester, Pa., on August 29.

Under the plan and agreement of May 12, 1915, of the Westinghouse Electric & Manufacturing Company, stockholders have taken all but $457,000 of the $20,710,000 new convertible bonds offered to them.

The Selby safety flag, described in the *Railway Age Gazette* of July 16, page 106, has been adopted as the standard flagman's outfit by the Mobile & Ohio, Illinois Southern, and St. Louis & San Francisco, and is now under service test on 15 other railways.

David Newhall has opened an office in the Lincoln building, Philadelphia, Pa., and represents in the eastern district the National Boiler Washing Company and the National Waste Company, both of Chicago. Mr. Newhall will handle also various lines of railway and mill supplies.

A new corporation, Johnson, Sharp & Co., has been formed, with office in the Commercial Trust building, Philadelphia, to deal in iron and steel and their by-products, scrap material and coal and coke. George T. Johnson is president and Sydney T. Sharp is secretary and treasurer.

A. Q. Tucker, vice-president of the Hydraulic Press Manufacturing Company, Mt. Gilead, Ohio, has been elected president, succeeding M. Burr Talmage; W. G. Beebe has been elected vice-president, succeeding Mr. Tucker; F. B. McMillin continues as general manager and secretary, and M. W. Spear has been elected treasurer, succeeding H. B. McMillin.

The Chicago Great Western has awarded a contract to the Roberts & Schaeffer Company, Chicago, for building a fireproof standard counterbalanced locomotive bucket coaling plant with automatic operation at Clarion, Iowa. The Chicago Great Western has in operation three plants built by the Roberts & Schaeffer Company a year ago. The contract price for the plant at Clarion is $10,000.

Robert W. Hunt & Co., Chicago, has been commissioned to make what is known as their special inspection of the 115,000 tons of rails and accessories which, as mentioned previously in these columns, has recently been ordered by the Russian Imperial Railways Commission from the Cambria Steel Company, the Pennsylvania Steel Company, the Illinois Steel Company and the Tennessee Coal, Iron & Railroad Company.

H. V. Jamison, advertising manager of the American Sheet & Tin Plate Company, Pittsburgh, Pa., has been awarded a gold medal by the Panama-Pacific International Exposition Society in recognition of his services in the installation of the exhibits of the United States Steel Corporation and its subsidiaries. The United States Steel Corporation decided to make an extensive exhibit at San Francisco and Mr. Jamison was appointed director of exhibits. The corporation was accorded a grand prize for its exhibit and the gold medal was awarded to Mr. Jamison.

Edward M. Grove, treasurer of the McConway & Torley Company, Pittsburgh, Pa., died on Thursday, August 26. Mr. Grove was born in Chambersburg, Pa., on October 12, 1857. He went to Philadelphia when 14 years old and worked for a time in a printing office. In 1876 he became a telegraph operator. After three years of work as operator he was made district superintendent of the Pullman Company at Cincinnati, Ohio, and was later transferred to Jersey City, N. J. In 1886 he became assistant general manager of the Wagner Palace Car Company, with office in New York. In 1889 he resigned to become associated with the McConway & Torley Company. He has thus been 26 years with that company and for the last 15 years has been treasurer. Mr. Grove was president of the Railway Supply Manufacturers' Association in 1910 and in 1911 and devoted his time and thought generously to the interests of that association.

E. M. Grove

TRADE PUBLICATIONS

CAST IRON PIPE.—The Central Foundry Company, of New York, has issued a small pamphlet entitled, Cast Iron Soil Pipe vs. Wrought Pipe, which is devoted to a discussion of the relative durability of the two kinds of pipe as ascertained from samples of wrought iron pipe taken from the Waldorf-Astoria and of cast iron pipe taken from the old Astor House.

RESULTS OF ELECTRIFICATION.—This is the title of Circular No. 1505, which has recently been issued by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. This

so-called circular is a book 9 by 11 inches in size, containing 72 well-illustrated pages. It aims to show the results obtained by electrification on some of the important steam railways of the world, and to give information of interest and value to steam railroad operators on electrification work. Contained in the publication are well-illustrated descriptions of the Norfolk & Western, the Pennsylvania, the New Haven, and other electrifications installed by the Westinghouse company. The Westinghouse Electric & Manufacturing Company has also recently issued the first number of "Westinghouse Electrification Data," which is to be a periodical chronicling the latest advances in the field of heavy traction. The presnt number contains a discussion of electric locomotive characteristics, some interesting figures on the comparative maintenance costs of steam and electric locomotives, as well as data on the New York terminal electrification of the Pennsylvania.

Sand Dryers.—The Roberts & Schaefer Company, Chicago, has issued Bulletin No. 30, illustrating and describing the "Beamer" patent steam sand dryer, made by that company for drying sand for locomotive use.

Power Transmission Machinery.—The Mesta Machine Company, Pittsburgh, Pa., has issued Bulletin Ka. containing a horsepower chart for determining the variables for rotating parts transmitting power, such as gears, pulleys, rope wheels, etc.

Pneumatic Tools.—Bulletin No. 130, issued by the Chicago Pneumatic Tool Company, Chicago, deals with the lubrication of pneumatic tools and treats also of Airoilene grease and oil, Chicago Pneumatic Oilers and the Little Grant Grease Machine.

Pipe Accessories.—The William Powell Company, Cincinnati, Ohio, has issued a booklet relative to the company's line of oil and air vents, expansion joints, valves and other accessories for oil wells and refineries.

Power Hammers.—Beaudry & Co., Boston, Mass., have recently issued a booklet relative to the Beaudry Champion and Peerless power hammers, respectively. The booklet describes the hammers in detail and contains tables of sizes and dimensions.

Ball Bearings.—The S. K. F. Ball Bearing Company, New York, has recently issued a very attractive booklet relative to the economies of the light car in electric street railway service and the saving to be obtained by the use of ball-bearing journals on such cars.

Automatic Mail Exchange System.—The Hupp Automatic Mail Exchange Company, Washington, D. C., has issued a booklet describing its system for taking on and delivering material at high speeds and giving in detail the nature of the equipment and its performance.

Optical Instruments.—The Bausch & Lomb Optical Company, Rochester, N. Y., has issued a pamphlet describing its microscope for the inspection and testing of materials. The various instruments manufactured by this company for this purpose are described in detail with illustrations.

Metal Shears.—The Canton Foundry & Machine Company, Canton, Ohio, has recently issued a catalogue entitled Canton Alligator Shears, describing and illustrating the company's line of metal cutting shears. These shears are equipped with double gears to counteract tortional strain. They are furnished with either belt or motor drive, but the belt drive is advocated as being more flexible.

Unions.—The Jefferson Union Company, Lexington, Mass., has issued a catalog describing the Jefferson unions of various types. The booklet contains views of the different kinds of unions and shows for what purposes they are made. The patented feature of this company's product is the brass seat ring, placed in a recess away from the runway of the fitting.

Corrosion:—The Cause, the Effect, the Remedy.—The Stark Rolling Mill Company, Canton, O., has issued a 100-page pamphlet which calls attention to the marked increase in the tendency to corrosion attending the introduction of sheet steel manufactured by the Bessemer or open hearth processes. An account is also given of the various causes of corrosion and describes also the manner in which these troubles have been overcome in Toncon metal. Fifty pages describe and illustrate the various uses for this product.

Railway Construction

Canadian Pacific.—The report of this company for the year ended June 30, 1915, shows that the company has 60 miles of new line under construction, on which work is now under way, as follows: On the Interprovincial & James Bay from Kipawa, Que., north 10 miles; on the Alberta division, the Stirling East branch, from Stirling, Alta., east 25 miles, and on the Swift Current North branch from Coronation, Alta., northwest 25 miles.

Cumberland Traction.—Organized in Kentucky with $50.000 capital to build a line between Edmonton, Ky., and Elizabethtown. Right of way has been secured and the first section to be built will be between Edmonton and Hiseville, 16 miles. G. H. Greenup, Elizabethtown, is back of the project.

Dayton & St. Mary's (Electric).—This company was organized recently, it is said, to build an electric line from Covington, Ohio, north to Ft. Loramie, about 16 miles. The surveys have already been started. D. Dwyer, president, Dayton, Ohio.

Georgia Roads.—The Chamber of Commerce of Rome, Ga., is conferring with the Seaboard Air Line, it is said, to secure the construction of a railroad from Rome south to Fish, 14 miles.

Gulf, Florida & Alabama.—Construction work is being pushed it is said, on the extension from Broughton, Ala., north to Kimbrough, 52 miles, and it is expected that a connection with the Southern Railway at Kimbrough will be made early this fall. Abutments for the drawbridge over the Alabama river at Yellow Bluff, Ala., are nearly ready for the steel work, for which a contract has been given to the American Bridge Company. An additional pier is also being built at the marine terminal at Pensacola. (April 23, p. 913.)

Helena & Southern.—Incorporated with $500,000 capital, it is said, to build from Helena, Mont., to Yellowstone Park. A section of the proposed route is to be over a partly graded line of the Three Forks, Helena & Madison Valley, which started work in 1912, on a line from Helena south to Yellowstone Park, about 150 miles, and up to January of this year had grading work finished on about 20 miles. E. A. Tennis, Salina, Kan., and formerly of Three Forks, Mont., is an incorporator.

Huron & Northeastern.—The Huron Investment & Construction Company is engaged in preliminary work on the proposed line to be built from Huron, S. D., north to Wahpeton, N. D., and eventually east to Duluth, Minn. It is expected that construction work will be started next month. The company filed articles of incorporation in South Dakota early this year with a capital of $25,000 and headquarters at Huron. The incorporators include F. W. Henderson, Summit, S. D.; W. Pelham, Sioux Falls, S. D.; C. E. Wolfe and F. Budack, Wahpeton, N. D., and C. B. Adams, Chicago, Ill. At the same time the Huron Investment & Construction Company, with a capital of $50,000 was incorporated by the same interests.

Illinois Central.—The extension of the Illinois Central from Benton, Ill., to Old Ben Mine, a mile and a half out of West Frankfort, has been completed. It will be used solely for freight purposes.

Lexington & Eastern.—See Louisville & Nashville.

Louisville & Nashville.—Engineers are locating a branch of the Lexington & Eastern, it is said, up Colly creek near Whitesburg, Ky., to reach a rich coal and timber field in Letcher county. It is expected that a contract to build the branch will be let before November.

Morgan-Fentress.—An officer writes that the plans call for building a line from Nemo, Tenn., northwest to Jamestown, 56 miles. A contract has been let to the Cumberland Construction Co., Harriman, Tenn., to build a section of 13 miles. The first section of 15 miles from Nemo via Castoosa, Parker and Mantrin is now in operation. The company expects to develop a traffic in forest products, coal, etc.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—Work is now under way, it is said, on an extension of the valley line from Centerville, Tenn., to Totty's bend.

NEWTON, KANSAS & NEBRASKA.—This company, which was organized in 1912, to build from Milton, Kan., north via Newton and Abilene to Fairfield, Neb., will start work soon, it is said, on the line. A construction company has been organized at Newton to carry out the work. S. O. Waddell, chief engineer, Newton, Kan.

NEW YORK SUBWAYS.—The New York Public Service Commission, First District, has authorized the New York Municipal Railway Corporation to award the contract for the erection of steel, construction of track, etc., for the third tracking of the Broadway elevated railway in the borough of Brooklyn between Myrtle avenue and Aberdeen street to the Johnson-Gifford Company, the lowest bidder, at $400,441. (July 23, p. 181.)

OZARKS RAILWAY.—Incorporated to build a railroad from a point in Ozark County, Mo., 10 miles from the Arkansas line, to Rothville, Baxter County, Ark., a distance of 36 miles. The capital stock is $900,000, and the stockholders are: K. V. Lobbs, H. S. Wickersham, S. C. Bates and E. C. McAfee, of Springfield, Mo., and C. C. Feuster, of Mountain Home, Ark.

PETERSBURG & APPOMATTOX (ELECTRIC).—An officer writes that work is now under way building from Petersburg, Va., northeast to City Point and Hopewell, ten miles. The contract has been given to the Vaughan Construction Company, Roanoke, Va. The plan includes building a station, also a sub-station. T. M. Worthan, president, Richmond, Va.; W. W. La Prade and E. Wortham, engineers. (Aug. 20, p. 358.)

PHILADELPHIA (PA.) ROADS.—Contracts for the construction of the city hall station and tunnel section of the Broad street subway, and for the construction of foundations for the Frankford elevated in Philadelphia, Pa., have been signed, and the work is to be started on September 13. The Keystone State Construction Company was awarded the city hall station contract at $1,700,000. The contract for the foundations for the Frankford elevated, extending from Callowhill street on the south to Unity street on the north, was awarded to James D. Dorney at $142,590. (July 23, p. 182.)

SALEM & PENNSGROVE TRACTION.—Under this name a line is projected from Salem, N. J., north via Pennsville to Pennsgrove, about 12 miles. No action will be taken for the construction of the line until the engineers now at work make a preliminary report. A. B. Smith, secretary and treasurer of the Smith, Davis Lumber Company, Salem, is interested.

SALINA NORTHERN.—Contracts have been let for the equipment and for materials for building, from Salina, Kan., through Saline, Lincoln, Mitchell and Osborne counties to Downs and Osborne, 90 miles. Three miles of track has been laid and grading work is about finished between Salina and Lincoln, 35 miles. Several bridges are under construction. The Keystone Construction Company, Salina, Kan., of which E. A. Tennis is president, is building the line.

SHENANDOAH, FRACKVILLE & POTTSVILLE.—A contract is reported let by this company to J. B. Trexler, Reading, Pa., to build a line to connect Frackville, Pa., with St. Clair, five miles.

SOUTH DAKOTA ROADS.—A new company has been incorporated in South Dakota with $2,000,000 capital by residents of Yankton to build a railway from Yankton, S. D., north through the counties of Yankton, Turner, McCook, Lake, Kingsbury, Hamlin and Codington to Watertown, 145 miles. The incorporators include Edward S. Johnson, W. J. Fantle and W. E. Heaton, of Yankton. The same interests have incorporated the Yankton County Bridge Company, with a capital of $1,000,000, to build a bridge over the Missouri river at Yankton.

SOUTHERN RAILWAY.—Bids have been asked for double-tracking work, it is said, between Greenville, S. C., and Central, 26 miles, and contracts for the work will be let about September 6. Plans are also being made for double-tracking work between Charlotte, N. C., and Spartansburg, S. C., and it is understood that contracts for the work south of Charlotte, which will involve very heavy construction, will be let soon.

TAMPICO & PANUCO.—According to press reports from Tampico, Mexico, a large force of men is now at work grading this line and track-laying will be started soon. The projected route is from Tampico, Mexico, to Panuco, 46 miles, and the plans call for extending the line eventually for a total distance of about 250 miles. The line is to be built to provide the Topila and Panuco oil fields an outlet in addition to the water route of the Panuco river. The project is backed by British capitalists.

THREE FORKS, HELENA & MADISON VALLEY.—See Helena & Southern.

RAILWAY STRUCTURES

ANACORTES, WASH.—The Great Northern is building a two-stall frame engine house.

BALTIMORE, MD.—An officer of the Baltimore & Ohio writes that plans have been made to build a new steel coal pier at Curtis Bay, Baltimore, but authority has not yet been given to begin the construction work.

CHICAGO, ILL.—The Illinois Central has awarded the contract for subways at Forty-eighth, Fifty-second and Fifty-sixth avenues, Cicero, to the Pleas Concrete Construction Company, of this city. The Bates & Rogers Construction Co., of Chicago, has been awarded the contract for the reconstruction of three bridges on the Indiana division of the Illinois Central.

CLARION, IOWA.—The Chicago Great Western has awarded the contract for a new 100-ton coal chute in this city to Roberts & Schaefer Co., Chicago. The coaling station will be a steel-balanced bucket type equipped with scales and reversible Ogle automatic hoist, operated by a distillate oil engine.

DALLAS, TEX.—The city commission of Dallas has passed an ordinance extending to December 20 the time in which to begin construction work on a union interurban railway passenger station in Dallas, to be built jointly by the interurban lines centering in Dallas. The Stone & Webster Engineering Corporation, Boston, Mass., it is said, has already secured a site for the proposed station and terminals.

DESHLER, OHIO.—A contract has been let to George Georgenson, Hamilton, Ohio, and it is expected that work will be started soon on a new union station in Deshler, to be used jointly by the Baltimore & Ohio and the Cincinnati, Hamilton & Dayton. The new station will be of brick construction with a tile roof.

FT. DODGE, IOWA.—The contract for remodeling the mechanical terminal of the Illinois Central at Ft. Dodge has been let to the Stoddard Construction Company, Chicago.

KENSINGTON, ILL.—The Illinois Central has let the contract for a new passenger station in Kensington to T. S. Leake & Co., Chicago.

LOGANSPORT, IND.—The Vandalia has let the contract for the construction of a bridge over the Wabash river on the Michigan division to the Wisconsin Bridge & Iron Company, North Milwaukee, Wis. The bridge will consist of five riveted Pratt truss spans 113 ft. 3 in. long on stone piers and abutments reinforced with concrete. The superstructure will contain about 200 tons of steel. The estimated cost of the superstructure, including erection, is $60,000.

MACON, GA.—The Central of Georgia is making plans for a viaduct, to be built over Pine street. The work has not yet been authorized.

MOUNT VERNON, N. Y.—Contracts for the elimination of the Mount Vernon avenue and Oak street grade crossings and the erection of a new station on the West Side will be let by September 20, according to an order just issued by the New York Public Service Commission, First district. The order also provides that the work of removing the tracks from the present right of way to the right of way, 350 feet eastward, must be commenced on or before October 1, 1915.

NEW YORK.—The New York Public Service Commission, First district, has awarded the contract for the construction of station finish on Section No. 2 of Routes Nos. 36 and 37, the Astoria elevated line, in the Borough of Queens, to Charles Meads & Co., the lowest bidders, for $268,102. (August 13, p. 302.)

The Altoria Realty & Construction Co. submitted the lowest bid at $860,636, for the station finish work on Routes Nos. 16 and 18, being respectively the Jerome avenue and White Plains

road elevated lines in the borough of the Bronx, New York City.

The New York Municipal Railway Corporation has awarded to John Thatcher & Son, the lowest bidders, at $320,325, the contract for the construction of eight stations in connection with the third-tracking work on the Broadway elevated line in the borough of Brooklyn.

Portsmouth, Va.—The Seaboard Air Line has given a contract to the Christian Construction Company, Durham, N. C., to build additional shop facilities at Portsmouth. The work will include a machine and erecting shop, blacksmith shop, flue shop, engine carpenter and paint shop, also a sub-station. The work will be pushed to completion, and it is expected that it will be finished early in 1916. There is considerable steel work involved in the construction of the main buildings, and hy-rib walls or similar material will be used in the machine and erecting shop.

Rockford, Ill.—The Illinois Central has let a contract to the H. W. Nelson Company, Chicago, for the concrete work in rebuilding a bridge over the Rock river.

Royston, Ga.—Bids are wanted by the Southern Railway for building a new station of frame construction at Royston to replace the structure destroyed by fire.

San Antonio, Tex.—The directors of the San Antonio Belt & Terminal Company have formally accepted a 25-year franchise from the city commission authorizing the construction of new passenger and freight terminals.

San Diego, Cal.—The San Diego & Arizona will erect a steel bridge across Campo Creek at the end of Tunnel No. 4. Charles W. Corbaley Company, Los Angeles, has been awarded the contract for the construction work and the Llewellyn Iron Works of Los Angeles will furnish the steel.

St. Paul, Minn.—Work on the proposed St. Paul Union Depot has been delayed by the refusal of the United States board of army engineers to approve certain changes in the river channel suggested by the Union Depot Company.

The Dalles, Ore.—The Oregon-Washington Railroad & Navigation Co. has let contracts for building roundhouses and machine shops, it is said, at The Dalles and at Pilot Rock. The estimated cost of the work is $95,000.

Waterloo, Iowa.—The Waterloo, Cedar Falls & Northern has given a contract to the Black Hawk Construction Company, it is said, to build a freight house on Utica street, near Mulberry street, in Waterloo. The building will be 40 ft. by 200 ft., and will be of steel, brick and concrete construction. It will cost about $50,000.

West Milton, Pa.—The Pennsylvania Water Supply Commission has approved the plans of the Philadelphia & Reading for a new bridge to be built over the Susquehanna river at West Milton. It will consist of fourteen through girder spans, replacing the present bridge.

Wilmington, Del.—Contracts have been let by the Baltimore & Ohio to the James F. Brogan Company, Philadelphia, Pa., for the concrete foundation and to the King Bridge Company for the superstructure of a bridge to carry Lancaster avenue over the tracks in Wilmington. Work will be started on the improvement at once.

Yankton, S. D.—See South Dakota Roads under Railway Construction.

Extending American Coal Trade.—The first cargo of American coal that there is any record of as having reached Patras, Greece, was received there late in July. The cargo, consisting of 6,000 tons of Pocahontas coal, was shipped from Norfolk and 3,400 tons was for use on the Piraeus-Athens-Peloponnesus Railway (locally called the Pap). It is said that the price of the coal at Patras was $15.07 a ton.

Port Conditions at Marseilles.—Almost since the beginning of the war there has been congestion at Marseilles, France, and a large number of ships have had to wait in the harbor for an opportunity to discharge cargo. There are now only about three ships in the outer harbor and 22 in the basins awaiting berths. It is expected that conditions will become normal in about six weeks. New warehouses, with a total capacity of 80,000 tons, have recently been completed.

Railway Financial News

Delaware & Hudson.—A meeting of stockholders is to be called September 30 to authorize an issue of $14,451,000 5 per cent 20-year convertible bonds to be offered to stockholders of record as of September 9 at par. The offering is to be made subject to the necessary approval of the New York Public Service Commission and has been underwritten by Kuhn, Loeb & Co. and the First National Bank, both of New York. The bonds are convertible for 10 years beginning October 1, 1917, on a basis of $1,500 face value of bonds for 10 shares of stock, the total par value being $1,000.

Lake Erie & Pittsburgh.—The Public Utilities Commission of Ohio has approved the issue of $3,540,000 first mortgage 5 per cent bonds of 1915-65, guaranteed jointly by the New York Central and the Pennsylvania Company.

Louisiana, Texas & Mexico.—See New Orleans, Texas & Mexico.

Missouri Pacific.—A new protective committee has been formed to represent the trust 5 per cent bonds, due January 1, 1917, and the first collateral mortgage 5 per cent bonds, due August 1, 1920. The committee consists of Moreau Delano, of Brown Brothers & Co., New York, chairman; Willard V. King, president, Columbia Trust Company, New York; Asa S. Wing, president, Provident Life & Trust Company, Philadelphia, Pa., and L. Edmund Zacher, treasurer, the Travelers' Insurance Company, Hartford, Conn. Bondholders are requested to deposit their bonds with the Columbia Trust Company, New York. The interest due September 1 on the trust 5 per cent bonds was not paid by the receivers and the committee has arranged to advance to depositing bondholders the amount of the coupon due September 1 and has also arranged to advance the interest due February 1, 1916, on the collateral mortgage 5 per cent bonds in case that interest is not paid by the receivers.

National Railways of Mexico.—The annual meeting is to be held October 6 and at that time it is proposed to ask authority from the stockholders to issue prior lien and general mortgage bonds as is found expedient, and at that meeting also will be presented the report of the board of directors for the two years ended June 30, 1915.

New Orleans, Texas and Mexico.—Arrangements are understood to be nearly completed for the formation of a new company to be called the Louisiana, Texas & Mexico, to take over the New Orleans, Texas & Mexico, which went into the hands of a receiver along with its parent company, the St. Louis & San Francisco. Stock of the New Orleans, Texas & Mexico is held by the St. Louis & San Francisco, but will receive nothing in the reorganization. Holders of the $28,582,930 first mortgage 5 per cent and 4½ per cent bonds will be asked to subscribe to the extent of 20 per cent of their holdings to new first lien collateral trust 6 per cent bonds and will receive in exchange for this subscription and their present holdings, beside the first lien collateral 6s, 50 per cent of their present holdings in 5 per cent income bonds and 50 per cent in stock. Bondholders who do not subscribe for the new first lien 6s will receive but 40 per cent of the income bonds and 50 per cent new stock. It is said that the Guaranty Trust Company and the Columbia Trust Company, both of New York, are to underwrite the plan.

Pennsylvania.—The Public Utilities Commission of Ohio has approved of the issue of $1,222,050 special guaranteed 4 per cent stock of the Cleveland & Pittsburgh, a subsidiary of the Pennsylvania, to the Pennsylvania to remimburse that company for expenditures made for capital purposes.

St. Louis & San Francisco.—It is understood that a syndicate is being formed to lend to the St. Louis & San Francisco stockholders $45 of the $50 assessment which the plan of reorganization calls for from the holder of each share of stock. Stockholders will, of course, put up as collateral for this loan the securities which they are to receive in the new company.

See also New Orleans, Texas & Mexico.